APPLICATION OF A MICRO COMPUTER-BASED MANAGEMENT INFORMATION SYSTEM TO IMPROVE THE USAF SERVICE REPORTING PROCESS

THESIS

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To my wife, Ginger, these words could never express my true gratification and love for you. You have provided the momentum necessary to successfully keep me going. Without you and Michael, I would have little reason to continue. I will forever rely on your strength to help me reach those goals that mean so much to both of us.

Mark H. Mol

Table of Contents

List of Figures

List of Tables

Abstract

This study conducted research into the development, implementation, and evaluation of a personal computer based Service Reporting (SR) Management Information System (MIS). The Enable™ software application program was developed as a result of reviewing T.O. 00-35D-54, USAF Materiel Deficiency Reporting and Investigation System; interviews with MIS experts and System Program Office (SPO) acquisition managers; and software prototyping with an Aeronautical Systems Division (ASD) SPO. The Service Reporting Management Information System (SRMIS) was implemented and evaluated in the Air Force One (AF-!) Replacement Aircraft SPO during a five month trial period. Following the trial, additional feedback was provided through questionnaires and personal interviews with SPO personnel and the HQ AFLC manager responsible for the policy and procedures established in TO 00-35D-54. The PC based system was then demonstrated to other SPO SR managers and the manager responsible for ASD SR policy and guidance.

The purpose of the PC based system is to provide SPO managers with an alternative to the existing manual or mainframe material deficiency data recording, tracking, and reporting system. The final application package provided both efficiency and effectiveness improvements for AF-1 SPO. The MIS, integrated with the process model, provided a clear logical method for data input, performed the processing necessary to assist managers with trend and performance analysis, and output program office memos, contractor

correspondence, messages to external organizations, material review board charts and upper management status reports. In addition, the package was designed to be tailored and implemented to meet the unique requirements of other small to mid-sized SPO.

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I. Introduction

General Issue

System Program Office (SPO) managers are required by regulation to implement a Service Reporting (SR) system to track, investigate, and analyze component failures on new or modified weapon systems. Often program offices fail to meet basic requirements established by technical order (TO) TO 00-35D-54, USAF Material Deficiency Reporting And Investigating Systems, even when the recommended mainframe SR system is implemented. Although the mainframe is not the direct cause of program offices not meeting requirements, the inability of the mainframe system to meet the processing needs of certain program offices clearly contributes to the problem. Additional options need to be available to SPO service reporting managers which will improve their ability to manage the complexities of material deficiency reporting.

Specific Research Problem

A Personal Computer (PC) based Management Information System (MIS) would appear to solve many of the problems characteristic of the current Information Central (INFOCEN) mainframe SR database and provide

additional benefits to the existing SR system. The objective of the research effort is to develop a PC based MIS which will improve the ability of service reporting managers to meet established reporting requirements and increase the SR system efficiency and effectiveness.

Investigative Questions

1. What SR processes, currently automated by the INFOCEN mainframe system, can be automated using a PC based MIS?
2. What improvements can be made to the SR system by implementing the PC based MIS?
3. What PC based MIS can be developed to satisfy the needs identified by investigative question 1 and 2?

Scope of the Study

This study is limited to Air Force Systems Command (AFSC) Aeronautical Systems Division (ASD). Information will be gathered and implementation of all application programs designed and written during this research effort will be accomplished at Wright Patterson Air Force Base (WPAFB) SPOs. These organizations were chosen because of their proximity to the Air Force Institute of Technology (AFIT). Although resource constraints allowed implementation in only one SPO prior to publication of this study, the programs produced during this project provide a service reporting MIS that should prove valuable in a wide variety of situations. The analysis of user requirements and modeling of the SR system and office procedures applies to all Air Force System Command (AFSC) program offices.

Limitations

One limitation of this research is that the application will be developed using IBM compatible micro-computer hardware and software. The software used to generate the MIS will be available on current Air Force contracts.

Due to some of the size and speed limiting characteristics of current micro-computer hardware and software technology it is not the attempt of this research to replace the mainframe INFOCEN SR data base. The final product of this research should provide small to mid-range program offices an alternative system for managing the SR process.

Assumptions

The following assumptions have been made concerning this research effort:

1. Potential users of the SR MIS developed during this study have access to an Air Force standard small computer (Zenith™ Z-248 or equivalent) with at least one floppy disk drive, a 20 megabyte or larger Winchester™ disk drive, a letter quality printer (Diablo™ 630 or equivalent), and the Enable™ and MS-DOS™ software needed to run the application programs.

2. Potential users of the SR MIS have received basic Enable™ software training and are proficient in the operation of both the hardware and software.

II. Literature Review

Overview

The aim of this chapter is two-fold. First, it serves to provide an overview of the Air Force service reporting system. The overview will include the purpose, process, and the internal program office procedures used to implement and maintain the SR system. Official SR policy and procedural information contained in this literature review was summarized from the single published source covering the topic, TO 00-35D-54. Additional information regarding internal office procedures was collected from SR plans and three and one-half years of personal experience associated with the C-12, C-21, C-20, C-5B, and C-5A Space Cargo Modification service reporting systems. The literature review will then focus on current practices in the development and use of MISs to reveal applications for the SR system.

Air Force Service Reporting

Service Reporting is a very tedious, time-consuming, complicated process; however, program office personnel often do not look beyond the rigorous internal procedures to see the contribution they are making to the overall weapon system improvement. Dr. W. Edwards Deming, the father of total quality management, insists that "improvement is not a one-time effort" and that "management is obligated to improve continually" (21:66). In fact, the service reporting system implements this philosophy by providing direct feedback from the technical experts operating the new systems to the people who can directly control the design and manufacture processes. Weapon systems' reliability, maintainability, and operability can be increased by

continuously improving the manufacturing and design processes. One critical foundation of the Deming method is to "base decisions. . .on accurate and timely data, not on wishes or hunches or 'experiences' " (21:96). It is for these reasons that service reporting is vitally important to the development of our nation's critical weapons systems.

The Purpose of Service Reporting. TO 00-35D-54, USAF Materiel Deficiency Reporting and Investigating System, is the technical order which establishes the system to identify, report, and resolve deficiencies on hardware, software, and computer resources. The technical order establishes procedures designed to implement direction provided by AFR 66-30, Product Improvement; AFR 74-6, Reporting of Product Quality Deficiencies Across Component Lines; AFR 80-14, Test and Evaluation; AFR 800-14, Management of Computer Resources in Systems; and AFR 800-47, Weapon System Warranty Program.

There are two major categories of reporting: service reporting and deficiency reporting. Deficiency reporting is performed following Program Management Responsibility Transfer (PMRT) from a SPO to the Air Logistic Center (ALC). At this point the ALC becomes responsible for maintaining the material, quality, software, and warranty deficiency reporting systems. However, prior to program transfer the implementing command's program office has overall responsibility for the system's development including resolution of deficiencies or proposed enhancements. TO 00-35D-54 contains the policy, responsibilities, and procedures for carrying out the implementing command's service reporting system (8: Sec 1-1).

The TO identifies two primary organizations and outlines their purpose. The user or test agency is responsible for the identification and reporting of a deficiency or proposed enhancement, while investigation of the deficiency and evaluation of the enhancement is the responsibility of the SPO. The organization that initially discovers the problem, typically the operating command or the test agency, identifies and documents the deficiency and begins the reporting process by submitting a detailed service report to the responsible implementing command's system program office. The service report contains all the relevant information about the problem, circumstances leading to the failure, and provides an assessment of the problem's significance. The SPO is then responsible for accomplishing the investigation of the deficiency and, if warranted, recommending corrective action (8: Sec 4-1).

The Service Reporting Process. The program manager has ultimate responsibility for establishing and maintaining an effective SR system (8: Sec 4-1). Implementation of the system requires the program office design an internal control process to allow team members to promptly investigate and respond to the service reports. The technical order allows the system to be tailored to the unique aspects of a particular program as long as minimum requirements are met and the internal program office system is documented. The documentation, in the form of a detailed operating instruction or service reporting plan, is used to establish the internal processes, management procedures, and organizational relationships necessary to control the SR system (1:1). In addition, the service reporting control system should be designed to help program office personnel manage the extensive information

network linking operating and supporting commands, participating test agencies, the program office, contract administration offices, contractors, and higher headquarters. To meet this requirement memorandum or letters of agreement are usually established between command agencies to specify the working relationships required to maintain a successful SR program.

The SR system establishes a systematic method for correcting problems with weapon systems and equipment. Figure 1 illustrates a generic SR processing system. The information contained in a service report required to document a component failure is originated by the using command or test agency (8: Sec 4-3) and sent to the system program office for preliminary analysis and investigation. The program office may then direct the prime contractor to provide a detailed analysis or tear down inspection and recommend corrective action. All SPO departments have review responsibility and are directly involved in the investigation and corrective action. Following an investigation, the materiel improvement project board composed of representatives from engineering, configuration, safety, program control, contracting, logistics, program management and the using agency (8: Sec 4-6) provide final recommendations to the program manager. If agreement is reached, the results are returned to the user and action taken.

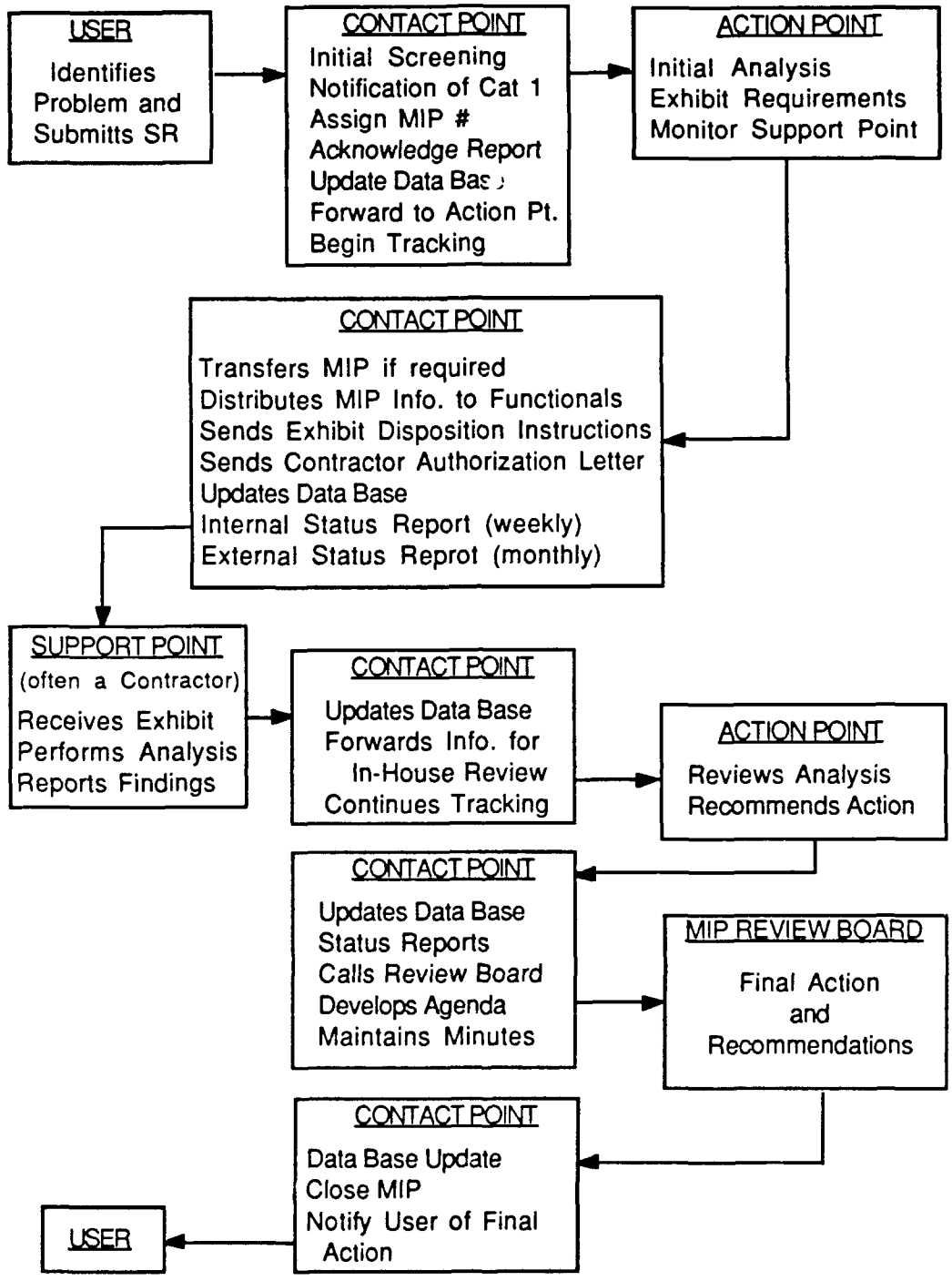


Figure 1. SR Process Model (adapted in part from 8: Sec 4, 11)

Service Reporting Procedures. The technical order requires that a material improvement project (MIP) be established by the program office when actions are necessary to investigate and resolve individual deficiencies (8: Sec 4-1). This action involves a set of unique management procedures which the program office implements in order to satisfactorily resolve the reported deficiency. The internal program office procedures are designed to meet the basic requirements of TO 00-35D-54 and provide the necessary internal control procedures to assure an efficient system.

Two positions within the system program office have primary responsibility for carrying out the established procedures. The contact point is primarily responsible for performing administrative functions: documenting and maintaining the SR system, log in and acknowledgement of SRs, monthly status reports, exhibit disposition instructions, and maintaining the official MIP record files (8: Sec 4-6). The tasks required to perform this function are generally well-defined by the TO and the program office plan. The second position, action point, is usually a group of project officers or engineers each responsible for a group of weapon system components. The action point is responsible for the initial analysis of the deficiency, support point tasking, monitoring the investigation, and developing the proposed resolution (8: Sec 4-7). The action point's tasks are much less structured than those of the contact point's since the effort requires selection and management of the most appropriate method for resolving the service report. The action point's decisions are largely based upon conditions surrounding the particular report, contract provisions, previous failure history, failure modes, and operational considerations. In order to make accurate decisions, the action

point relies heavily on the historical information the contact point maintains and the expert judgment of other functional program office members.

Recording, Tracking, and Reporting. Program offices rely on manual or mainframe information systems to record initial deficiency data, to provide periodic status reports and historical information, and to track the progress of the investigations until they are closed. Manual systems are used primarily during the test phase or on smaller or short duration programs that expect relatively few service reports. In these cases, hardware and software deficiencies are documented and investigated within the framework of the test or production program. Due to the large volume of required information, mainframe information systems become more practical on programs having an extended duration and stable data processing requirements. Each of these two systems has advantages and disadvantages that should be considered prior to the application of a system to meet the data recording, tracking, and reporting requirements of the system program office.

Manual System. The manual system offers several advantages to the program office. Perhaps the greatest advantage is the reduced amount of effort required to implement the record keeping and tracking function. The manual system does not require expert programmers or computer support functions, and is not tied to any single location. It can also be readily tailored to the level of effort deemed necessary to document and analyze the deficiencies. On the other hand, the manual system is impractical as a program increases in complexity. For example, the action point's ability to synthesize data from multiple SRs over an extended period of time is limited. Sort capabilities for the purpose of trend analysis are nearly nonexistent. As

the number of service reports grows, the contact point may also find it increasingly difficult to provide the necessary monthly status reports to the user, program management, and functional personnel.

Mainframe System. In response to the shortcomings of a manual SR system a centralized main-frame database was developed and made available through the INFOCEN system. This system is used extensively at Air Logistic Centers (ALCs) for material deficiency, quality, and software deficiency reporting (8: Sec 1-6) and at large AFSC program offices (eg., Propulsion and F-16 SPOs) for service reporting. The computer data base is heavily relied upon by ALCs to maintain historical and technical information relevant to failed weapon system components.

There are several reasons the mainframe is used to store material deficiency information. The data base requirements of the ALCs are typically much larger than SPO's since deficiency reporting requirements are maintained until the particular hardware or software system is retired out of service. The volume of historical data is therefore much larger and requires massive storage capabilities of a mainframe system. Another reason ALCs and large SPOs find the mainframe advantageous is that technical skills can be developed and maintained within the program office to manipulate the database to provide useful information to action points. In addition, working relationships with the computer programmers can be established to tailor the system to meet the long-range requirements of the responsible office.

The mainframe does offer excellent data storage, sort, and retrieval abilities; however, it has drawbacks. The mainframe's database is cumbersome to use, requires specially trained operators, has very limited

graphical and word processing capabilities, must be reprogrammed to meet new output requirements, and costs program offices and ALCs a substantial amount of money to maintain.

Personal Computer Based MIS

Some enterprising managers have developed information systems using PCs and fourth generation languages to counter the disadvantages of both manual and mainframe systems. "Many users become so frustrated with the level responsiveness of centralized systems that they construct their own formal and informal information systems" (5:23). Managers can gain control of their critical resources by using "fast, more flexible, data management technology" (6:89). This technology, available today in the form of PCs, telecommunications, and data base management software, has revolutionized traditional control systems. The technology helps managers use resources more effectively, align the organization with established goals, and collect data for strategic and operating decisions. More specifically, the technology has provided new opportunities for gathering, organizing, and using information (6:89). In order to maximize the benefit from these opportunities Igbaria, Pavri, and Huff call for "the design of highly flexible systems with optional modes of operation that will meet the varying needs of managers, thereby increasing the attractiveness of computerized information" (11:195). End user computing occurs when these systems are developed and used by non-data processing professionals to perform job related tasks (18:116).

End User Computing (EUC). Sipior and Sanders attribute the rapid growth of EUC to four factors. First, there is an increased awareness of EUC capabilities related to the increased number of college graduates with

computer skills. Second, with the advent of fourth generation languages and an abundance of available hardware EUC is more feasible. A third reason for the expansion is the increasing complexity of the environment in which organizations operate, resulting in growing demands for accurate and timely information. The final contributing factor is the inability of data processing departments to keep pace with increasing application development requests (18:118).

Carl Hammer, a mathematical statistician and member of the National Defense Executive Reserve, suggests that the office of today is doing as well as can be expected in its use of Electronic Data Processing (EDP) systems to "do the work of uncountable 'virtual clerks' ", but that "not enough attention has been paid to the office's real structure, a complex system of procedural processes" (10:15). Hammer explains that computer assisted procedural processing will improve performance in several ways: (a) by attenuating crisis management, (b) by providing a more streamlined execution of procedures, (c) by producing fewer errors through a better understanding of office functions and a reduction in human error, (d) by providing a relaxing and serene job environment, and (e) by increasing management's and worker's confidence in the system (10:22).

Implementation of EUC and Hammer's philosophy has been successfully demonstrated in a major insurance company. Prior to the design, development, and implementation of the Agency Information System (AIS) the regional office relied on a centralized mainframe data base with a simple, and very limited, structure to provide information for marketing and product development. The company identified the need to make improvements and decided to act. During the analysis phase managers, secretaries, clerks, and

the system builder were involved in identifying operational requirements. The company then selected the hardware and software, IBM PC/ATs and dBASE III™, which best met their needs. AIS was designed for efficient and effective fulfillment of the user requirements and took advantage of on-line capabilities, menu driven systems, full documentation, screen formatting, graphical capabilities, and flexibility for future expansion. The resulting system was reported to provide easy access to extensive maintenance, queries, and report generation features for users with minimal knowledge of dBASE™ and the ability to produce special reports and queries for persons with higher dBASE™ skill levels. Ultimately, the AIS helped to automate company and agent interfaces procedures to decrease policy issuance lag time. In addition, the application demonstrated that microcomputers and microcomputer-based software can be a viable alternative to expensive mainframe resources (3:15-19).

Defining the Needs. Prior to the start of information system development, accurate modeling of the office framework to meet the needs of the user must be considered. "Users are consulted on the outputs they desire, but they are rarely asked how they wish the system to operate" (16:252). Requirements will therefore have to be generated by an interaction process between the end users and the information system designer. Verrijn-Stuart and Anzenhofer concluded that two tools in particular aid the "communication between user and designer/builder of an information system: graphic diagrams and (indirectly) prototyping" (20:141).

Modeling. As Hammer described, more attention must now be paid to embedding office procedures into a computerized office information

system. However, appropriate models and tools are first required for specifying office tasks and user requirements. In this regard, office tasks are described as being "separable into smaller units to be carried out by some subset" (15:38) of the total organization. Maiocchi and Pernici (14) and Mazer (15) present socio-technical, process-based analysis modeling techniques for specification and refinement of office procedures. Although less sophisticated, Verrijn-Stuart and Anzenhofer (20) describe an information flow scheme which provides a graphical, process oriented method for modeling work activities in the business environment. "In the flow scheme, physical entities and flows are modeled, and data collections that are involved in these data processing activities are identified" (20:134). The most simplistic system analysis and design approach that appears to provide a structured data flow diagram similar to Verrijn-Stuart and Anzenhofer's concepts are those presented by Ricardo (17). Figure 2 depicts her recommended system which utilizes eight distinct symbols connected by lines to represent data flow. The resulting data flow diagram can then be used to provide a graphic model of the current system, used to analyze areas of improvement, and be used to develop objectives for the new system (19:648).

Prototyping. Prototyping is made possible by the advances of fourth generation languages and database technology (9:13; 20:139). Er identifies four essential steps of the prototyping process (9:13):

1. Identify the user's basic information requirements.
2. Develop a working prototyping.
3. Implement and use the prototyping system.
4. Revise and enhance the prototyping system.

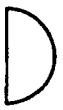
SYMBOL	NAME	MEANING
	Entity	A person, other system, or organization that supplies or receives data.
	Process	Shows where data is converted.
	Data Flow	Shows flow of data between origin and destination.
	Data Store	Shows where data is collected and stored
	Collector	Shows where several data flows are combined into single f[illegible] No processing occurs here.
	Separator	Shows wehre single data flow is split into individual, detailed data flows.
	Ring-sum Operator	Shows two possible data flows, only one will be followed.
	And Operator	Shows two data flows and both will be followed.

Figure 2. Data Flow Diagram Symbols (17:60)

The advantage of the prototyping approach is that the prototyping process can be repeated until the user is satisfied with the information system (9:15). Thus, prototyping maximizes the probability that the user's requirements will be accurately communicated to the designer/builder.

MIS Software Selection. Following identification of the user's requirements and modeling of the office organization, the MIS generator is selected. A generator is a "package of related hardware and software which provides a set of capabilities to build" (13:50) specific applications quickly and easily. Examples of these microcomputer packages include: Framework™, Symphony™, Enable™, PC Express™ and others (13:50).

Le Blanc and Jelassi offer an evaluation methodology for selecting DSS/MIS software. The methodology incorporates software screening, evaluation, and specific design requirements. Le Blanc and Jelassi screened all commercially available software based on minimum technical and functional criteria. The final three MIS/DSS generators, Symphony™, Framework™, and Enable™, were then evaluated on a weighted criteria (13:52-59). Table 1 illustrates the resulting evaluation matrix for the MIS/DSS software.

The weights applied to the criteria in Table 1 are appropriate based on the author's general knowledge of the basic requirements established for the future MIS development effort. The evaluation concluded that Enable™ was "superior in both internal and external documentation", "offered the most useful database module", and was the "superior package at providing comprehensive functionality in spreadsheet, database, and word processing in a single package" (13:61). Based on this evaluation and the fact that Enable™

TABLE 1
Evaluation Matrix for DSS/MIS Software (13:61)

Criteria	Weight	Generator Scores		
		Symphony™	Framework™	Enable™
IBM Compatibility	3	9	9	9
Database Size	3	3	3	9
Basic Statistics	3	9	9	9
Regression Analysis	1	0	0	0
Spreadsheet Size	3	3	6	6
Spelling Check	2	0	6	6
Grammar Check	1	0	0	0
Graphics	3	6	6	6
Spreadsheet Linking	2	6	6	4
File Import/Export	2	2	6	6
Combine Graphics/Text	2	2	4	6
Menu Dialogue	2	6	6	6
Command Dialogue	2	4	2	6
External Documentation	2	2	4	6
On-Line Help	3	9	9	9
Vendor Reputation	3	9	9	3
Totals		76	85	91

is considered to be the Air Force's standard word processing, spreadsheet, and data base package the author selected Enable™ as the MIS generator for the research effort.

Information System Success. Measurement of success is a very difficult phase following the development and implementation of the MIS. Anderson performed a study to investigate the factors and conditions that affect the implementation and utilization of information systems by workers. The results "provide support for the contention that the productivity enhancing aspects of technology will tend to promote user satisfaction" by

"enabling the worker to accomplish more tasks and/or complete tasks more easily" (4:184).

Another view asserts that to be successful, a computer application must have: (a) a real need, (b) good hardware, (c) adequate software, (d) a receptive environment, and most important (e) a champion (7:1). All of these elements are self explanatory, except possibly the last. In an organization like a SPO, an "early adopter" (7:6), the champion "is usually a middle level manager, in charge of the organizational entity where the system will be used" (7:10). The champion has the "desire to improve the efficiency of a real operation with a new automated system" (7:10). "This is the individual who has the vision, keeps pushing when the going gets tough, who generates creative energy, and makes it all happen" (7:5).

Summary

An overview of the Air Force service reporting and investigating system and a discussion of the current usage and important development aspects of MIS has been provided in this chapter. Service reporting management is a complicated system which requires extensive process controls and adequate resources to effectively maintain. Two key positions within the process are responsible for maintaining an effective system. The contact point must accurately transmit and store vast amounts of deficiency data. The action point efficiently manages the investigation to provide a resolution of the reported equipment problems. Currently one of two methods, the manual or mainframe data base, are used to assist the program office personnel maintain the SR system.

Micro computer-based management information systems can fill a computing gap between manual and mainframe systems. End user computing has been demonstrated to fulfill organizational needs for rapid, flexible management information systems, but only if development of the computer system results in increased job performance and user satisfaction.

III. Methodology

Overview

Action Research was selected as the general research design used throughout this effort. The purpose of Action Research is "to develop new skills or new approaches and to solve problems with direct application to the classroom or working world setting (12:27)." Action research was used because it has been shown to be practical and directly relevant to actual situations in the working world while providing an orderly framework which allows a flexible and adaptive approach to problem solving. A sampling of employees available in the work environment is used to provide the researcher subjective opinions for analysis. While this research method will lead to findings which can be applied immediately to the work environment under study, application of results beyond the participating sampling may be slight (12:28-30).

MIS modeling and programing techniques are well-established and have been demonstrated previously. The most significant hurdle was to build the software application to meet the requirements of the SR process while ensuring the user's needs were also met. In addition, particular care was taken to ensure the application package developed by the author could be easily tailored to match the reporting requirements of other program offices. A further discussion of the methods used to answer each of the three investigative questions will now be provided.

Specific Methodology

The following steps were taken to answer the three investigative questions stated in Chapter I.

Investigative Question 1. What SR processes, currently automated by the INFOCEN mainframe system, can be automated using a PC based MIS?

Investigative question one required two different approaches to fully evaluate. First, a literature review was performed to provide an overview of the SR system and current trends in the development and use of personal computer based management information systems. Second, structured and informal interviews were conducted with SPO service reporting contact points and the current INFOCEN mainframe database administrator. Each of these two steps will now be explained in more detail.

Primarily the literature review focused on the governing TO for service reporting and current literature relevant to the application and development of PC based MISs. TO 00-35D-54 is the single source document providing instructions necessary to establish and maintain an effective service reporting program. The TO review was performed to determine official USAF policy requirements for SR tracking, investigating, and reporting. It was necessary to review TO 00-35D-54 to gain a general overview of the SR program requirements and process procedures which would be applicable to all system program offices.

The literature review also focused on personal computer based MIS. Literature searches were made through DIALOG Information Retrieval Service, Defense Technical Information Center (DTIC), and numerous periodical indexes. Specifically the literature was reviewed to determine

what type of PC applications have been successfully implemented to improve work environments and what type of benefits have been achieved by the host organization. In addition, those techniques used to design and implement PC based MIS were reviewed to determine what concepts may increase the likely hood of successfully developing an application to fulfill the SR needs of the SPO.

Personal interviews were conducted to determine what existing SR processes and procedures were currently automated with the mainframe database so that a baseline for the development of the PC based MIS could be established. In addition, it was hoped that some compatibility could be maintained between the two data base structures so that PC data could possibly be transferred to the mainframe and so that individual training and existing expertise would carry over to the PC system. Initial contact was established with the mainframe database administrator, Joan Nuss (HQ AFLC/MMTB) and the INFOCEN programmer, Ralph Bectal (ASD/SCTS). Information about the data structure and database storage, sorting, and reporting capabilities was gathered on the current DB26 and GO21 SR data bases and the replacement, GO21, mainframe database.

Structured interviews were also conducted with two SPO service reporting contact points to gain insights into the internal processes they used to manage their individual service reporting systems and to determine the pros and cons of the mainframe application. The interview instrument is contained in Appendix A. The contact points were provided by Mr. Jim Brindell of the ASD office of primary responsibility for service reporting (ASD/ENO). Four potential contact point interviewees were selected from the list of possible candidates since they each managed service reporting

programs in ASD "basket" SPOs (ASD/AE/RW/YZ/SD). For the purpose of this research basket SPOs are defined as those program offices, managed by a program director, having overall responsibility for the acquisition or modification of more than one weapon system. Of the four managers contacted only two were currently maintaining a service reporting system; the other two offices did not have current requirements for SRs and therefore did not have operational systems which could be studied.

Selection of the basket SPOs for study was based on the assumption that the multiple programs within each of these SPOs were usually smaller in scope and therefore had fewer resources to devote to establishing and maintaining a mainframe system. In addition, basket SPO acquisition programs normally last a shorter period of time thus reducing the need to process high volumes of data. Because the larger "super" SPOs (eg., B-1B, C-17, F-16) would not likely have these same processing requirements they were not considered candidates for evaluation or as prime targets for implementation of the PC based MIS.

Investigative Question 2. What improvements can be made to the SR system by implementing the PC based MIS?

To answer question two, a program office which had a requirement to administer a service reporting program, but had not yet established a control system to perform the reporting, investigating, and tracking of the individual service reports was selected to become a test case. The program office had to meet the following criteria to be selected: 1) be considered a member or a larger basket SPO organization; 2) have a current requirement to establish a service reporting system; 3) be a willing partner to design, develop, and

implement a PC based MIS to fulfill their needs; and 4) assist in the evaluation of the final product.

Personal contact with SPO acquisition personnel led the author to the Air Force One (AF-1) Presidential Aircraft Replacement Program Office (PO), ASD/SDCB. This program office met the criteria established above and was therefore selected for participation in this study. The AF-1 program manager, project managers, service reporting manager, test, configuration, manufacturing, and engineering personnel were all briefed on the potential applications and benefits of a PC based service reporting MIS. The personnel within the program office familiar with the service reporting program were individually interviewed to determine what procedures would be established to implement their internal control system and to determine what specific information they would need to manage each area of the process.

A time phased information flow diagram defining the AF-1 contact point's, action point's, support point's, and Material Improvement Project Review Board's (MIPRB) information requirements and reporting responsibilities was developed by integrating the responsibilities outlined in TO 00-35D-54, incorporating the specific requirements documented in the AF-1 Service Reporting Plan (2), and adding the undocumented internal control procedures which existed within the program office. The initial process flow diagram presented in the literature review was used as a base model and then modified to represent the AF-1 SR process. HQ AFLC/MMTQ, the office responsible for the policy and procedures established by TO 00-35D-54, was contacted to verify the information and process control model. The results of the interviews and information flow diagram were then analyzed

by the author to determine how the PC based MIS could be applied in the SPO environment. Additional MIS experts within ASD's Computer Center, (Mr. Steve Chorazewitz, ASD/SCPC), and AFIT's School of Systems and Logistics (Lt Col Chris Arnold, AFIT/LSY) were also informally interviewed to determine any further MIS applications which would enhance SR system.

Investigative Question 3. What PC based MIS can be developed to satisfy the needs identified by investigative question 1 and 2?

A computer program was written by the author to answer this question. The MIS was developed using Enable™, the model builder software package identified in the literature review, to automate those SR processes identified by investigative questions 1 and 2. Software programing experts and appropriate Enable™ programming manuals were used, as required, to assist the author and service reporting manager in the development of the computer application. The program was then validated by the AF-1 program office (ASD/SDCB) during a trial implementation period.

The SR MIS application program was used in the program office for the purpose of tracking, reporting, and storing AF-1 service reporting information during the aircraft's combined Qualification Test and Evaluation (QT&E) and Qualification Operational Test and Evaluation (QOT&E) Program. As the prototyping method suggests, recommendations for improvement were obtained during the trial period by personal interview and observation of the organization involved with the validation process. For the purpose of evaluating and validating the management information system, the trial period lasted from March 1990 to July 1990.

Following the initial trial period a questionnaire was given to all the members of the SPO who were involved with the tracking, reporting, and investigating of the AF-1 service reports. The questionnaire, as presented to key personnel in the SPO, is provided in Appendix B. The purpose of the questionnaire was to provide general feedback concerning the pros and cons of the Service Reporting Management Information System (SRMIS) and to provide recommendations for future improvement. The Air Force One program manager, who also acted as the material review board chairman, served as the validating official within the program office. His comments were solicited through the same questionnaire provided other managers in the SPO.

Finally, the capabilities of the AF-1 SRMIS were demonstrated to a group of service reporting managers including the manager responsible for the overseeing service reporting throughout ASD. Comments regarding the acceptability of the system were solicited from those in attendance in order to determine the extent to which the system may be applied in other AFSC program offices. A summary of these comments is provided in Chapter 4.

Summary

This chapter described the primary research methodology, action research, and a combination of techniques used to collect information necessary to develop, implement, and evaluate the PC based SRMIS. Each particular technique was selected by the researcher for its unique ability to extract information from knowledgeable sources. These methods included a literature review, informal and structured interviews, organizational and process modeling, software prototyping, and questionnaires.

IV. Findings and Discussion

Overview

The purpose of this chapter is to present the findings of the research effort. Three investigative questions were posed. By answering the first two questions many of the details about the SR process were documented, thus ensuring the software that was developed successfully addressed the needs expressed in the third research question.

Research Questions

Investigative Question 1. What SR processes, currently automated by the INFOCEN mainframe system, can be automated using a PC based MIS?

As discussed in the preceding chapter this question was answered using a combination of two methods. The literature review and interviews with the mainframe database administrator and SPO contact points provided the information necessary to determine those areas currently automated via the mainframe database system that were likely targets for PC automation. This approach provided valuable information from three different viewpoints concerning the application of the INFOCEN database to service reporting.

As described in the literature review, Section 4 of TO 00-35D-54 provides minimum requirements and detailed instructions to the SPO, as well as other involved agencies, concerning the SR system. Although the INFOCEN database is accepted as the standard tracking system throughout SR programs there exists only a single reference in section 4 of the TO as to the purpose of the mainframe system. The TO states, "[p]eriodic MIP status reporting is normally done through AFLCs DB26 system (8:Sec 4-6:). "The TO also provides two other alternatives depending on program needs and

available access to the mainframe system. The alternatives are status reporting by transfer of magnetic media or transfer by a manual system.

To achieve the mainframe reporting capability the status of MIPs must be maintained by the SPO in the centralized database with direct computer access provided to external agencies. On very large programs with potentially hundreds of "interested" parties, the capability to provide immediate on-line access to current MIP status substantially increases the amount of information available to users. Not only does the on-line status reporting capability give users flexibility to determine when, how much, and what type of information they wish to receive, but it indirectly provides the SPO with a method to internally track the progress of the MIPs.

The first interview related to research question one was conducted with the INFOCEN database administrator. The purpose of this interview was to obtain information about the existing mainframe database; its structure, field definitions, and output capabilities. The administrator outlined three roles the mainframe SR database was designed to perform. Primarily the mainframe system acts as a depository database for the detailed SR information. Secondly, the mainframe provides SPOs the ability to manipulate the stored data to provide standard and ad-hoc reports. Finally, the mainframe computer center provides a central location for read and write access to the database from any location worldwide. In addition to maintaining the database itself, the INFOCEN computer center provides user support in the way of system help, application program development, and general database training.

During this research effort, the mainframe database was undergoing a revision from the combined DB26/GO21 database to the new GO21 structure.

This effort was completed in June 1989. The two databases remain compatible except the new database contains additional fields not found in the older system. The new GO21 database uses 397 fields to record the SR information and is capable of producing numerous standard reports available from the directory. Generally the reports provide status tracking information for both the SPO investigators and external agencies. The database administrator can also provide specialty report formats to meet SPOs individual processing needs.

As a result of this interview several service reporting processes currently automated by the mainframe systems can potentially be automated via the personal computer application package. The Enable™ database can have up to 65,000 records with up to 254 user-defined fields containing up to 254 characters each. Enable™ also has extensive output capabilities to display the stored information. It is obvious the PC package can not match the seemingly endless mainframe storage capabilities; however, for the SPOs within the scope of this research effort the PC MIS would appear to offer similar SR historical data storage, sorting, and reporting capabilities.

First, the primary mainframe role of historical data storage can be mirrored by the PC application. In order to reduce the amount of time it takes a mainframe user to become familiar with SRMIS, required fields can be re-defined in the Enable™ database definition so that input data can be stored, edited, sorted, and reported in a similar fashion to the INFOCEN database. The maximum number of fields in the Enable™ database is 254; therefore, some reduction in the quantity of fields had to be made. This does not appear to be an operational problem since some of the INFOCEN fields are not normally used to maintain SPO service reporting information. If, as a

result of the elimination of selected fields, desired fields are not included in the SR application developed in this research effort the database may be modified to include the additional fields since SRMIS currently has 127 fields.

Like the mainframe, standard management reports which track the individual material improvement projects can be developed using Enable's™ report form definitions. The reports can be tailored to meet individual program offices requirements by modifying the report form files. The PC database, similar to the mainframe, also has the capability to sort on key fields in order to provide trend analysis, automatic MRB agendas, and more specific ad-hoc reports.

Unlike the mainframe, the PC database application does not have the capability to provide external users the ability to read and write to the database. Due to this limitation, reports to outside agencies will be generated in-house and mailed to respective organizations. If more rapid information transfer is desired by a program office, the PC software and hardware does exist to provide file transfer capabilities between two personal computers or a third party E-mail system. The SR initiation point could also generate the SR and send it via modem to the responsible SPO. In a similar fashion, the status reports can be generated at the SPO and sent electronically to the outside agencies.

Two SPO SR contact points directly responsible for maintaining their respective mainframe database were interviewed to determine what type of conditions the SPO service reporting programs were operating in, how the SPOs were currently using the mainframe system, and the advantages and disadvantages of the mainframe SR tracking system. The purpose of the interviews was to provide information to help determine key areas currently

automated by the INFOCEN data base that could potentially be automated by a PC MIS.

The first SPO interview was conducted with the SR contact point responsible for the TACIT Rainbow Launcher and ANLQ 172 support equipment. Management of SR tracking for these two programs is combined and has accounted for more than 300 reports since 1987. Currently the TACIT Rainbow Launcher program office receives 4 or 5 service reports per month from their single test location at Edwards AFB. Service reports for the TACID Rainbow Launcher program are input into the INFOCEN data base (DB16) via a direct line access. The ANLQ 172 program office, on the other hand, relies on keyboard entry from information on the standard DD Form 173 (electronic message form) submitted from any one of a hundred operational sites. These SR reporting and data input procedures are different because of the costs associated with the on line capability. The ANLQ 172 program office does not consider it cost effective to provide the training, hardware, and computer time to each of the hundreds of operational bases for the purpose of submitting relatively few SRs per year. The TACIT Rainbow program office feels that the on-line costs are acceptable since they only maintain three sites.

Both program offices primarily uses the mainframe data base to store historical SR deficiency data, provide on-line read capability to the prime contractors, and sort records to produce MRB agendas. In addition, the program offices uses the standard boiler plate reports available from the mainframe directory to internally track the status of the MIPs. These tabular reports typically include material improvement control numbers, action

points, part numbers, serial numbers, nomenclatures, problem summaries, and current status. Examples are provided in TO 00-35D-54.

The contact point for these two programs described a few difficulties associated with operation of the mainframe data base. He related annoyances associated with performing a desired operation on one level or screen and then having to use different key stroke commands to perform the same operation in other screens. In addition, the contact point pointed out that large reports were batch processed and picked up in the INFOCEN computer building or mailed to the office. Although not necessarily attributable to these or any other stated problem the contact point indicated that the status reporting requirements that the system was designed to perform were not being met on a consistent basis. Interim and thirty day status reports were not being provided to external organizations as often as required by the TO.

The second contact point interview was conducted in the Propulsion SPO. This SR management office currently has primary responsibility for two jet aircraft engine procurement programs. Due to the strict maintenance, operating, and safety requirement placed on aircraft propulsion systems the contact point receives more than 9000 service reports per year. The INFOCEN mainframe database provides direct access capability to more than 35 on-line sights consisting of worldwide operating bases, headquarters, Air Force Plant Representative Offices (AFPROs), and prime contractors. The initial SR information is input via electronic mail or by three dedicated data entry specialists. In-house training classes are made available to the more than 1000 external users once a year. As a result of these large scale activities the program office spends approximately $120,000 a year to maintain the INFOCEN account. Overall the system provides both the SPO and the

many external users with a very efficient way to record, track, and investigate the engine deficiency information.

Although the interviewee did not mention any major problems associated with the INFOCEN data base he did relay several advantages to the mainframe structure. These advantages include the low transmittal time; on-line closed loop communication with support points, users, and contractors; failure trend analysis; and performance measurement. The Propulsion SPO considers these capabilities vital to the efficient operation of the SR program due to the extremely large number of SRs that are generated and the potentially critical nature of each one.

There are several aspects of the Propulsion SPO's service reporting program that have not been discussed previously and are considered good candidates for incorporation into the PC MIS. These include exhibit parts tracking, performance measurement, draft correspondence generators, and late investigation and correspondence tracking. Each of the candidates are types of reports that are generated based on sort or conditional statements made to the existing database information. Similar reports can be made using the Enable™ database report forms provided the same fields are incorporated into the PC application and adequate historical information is maintained in the database.

In general, the literature review of TO 00-35D-54 and the interviews with the mainframe administrator and the SPO contact points has provided detailed information about the key service reporting processes that are automated by the mainframe SR database. Table 2 summarizes those processes and provides an initial target list of areas for incorporation into the PC based management information system.

TABLE 2

INFOCEN Mainframe SR Database Capabilities

- INPUT
  - Electronic and keyboard input of historical SR/MIP data
- PROCESSING
  - Sorting on key fields
  - Conditional statement to narrow data sets
- OUTPUT
  - On-line query to SPO and external users
  - Standardized reporting
    - external MIP status reporting
    - internal MIP status reporting
    - performance reporting on MIP investigations
  - Trend analysis
    - ad-hoc
    - standard analysis
  - Internal management reporting
    - support point tasking
    - draft correspondence

With the exception of on-line query by external users the PC application would appear to be capable of performing all processes currently automated by the mainframe database.

Investigative Question 2. What improvements can be made to the SR system by implementing the PC based MIS?

Investigative question one determined what inputs, processes, and outputs should be incorporated into the PC MIS in order to perform tasks currently automated by the mainframe system. In contrast, the purpose of answering investigative question two is to provide information which, when incorporated into the PC based system, will provide additional capabilities to improve the overall efficiency and effectiveness of a SPO's service reporting

program. As discussed in the methodology, the Air Force One Aircraft Replacement System Program Office (ASD/SDCB) was selected as a willing partner in the research effort. To answer investigative question two, a working relationship with this organization was established to increase the flow of potential SR system improvement ideas between the members of the SPO team and the researcher.

Initially the generic SR process flow chart presented in the literature review was used as an basic model to describe the internal control procedures used to run a typical SR program. As a result of observing the program office over a six month period and discussions with the team members, the model initially adapted from the TO proved inadequate. The model shown in Figure 3 more accurately represents the relationships that exist between internal and external organizations and those tasks necessary to process, investigate, and report the status of the MIPs in the AF-1 PO. Whether or not an automated or manual SR system was employed in the PO the new model was designed to represent those top level processes necessary to adequately control the SR system. The model remained general in nature so that it might be used in other program offices to communicate what actions are required by each team member to maintain an effective SR system. The model was validated by Mr. Dave Bubenheim (HQ AFLC/MMTQ) who has overall responsibility for MDR/SR policy and procedures within TO 00-35D-54. Mr. Bubenheim did note, however, that the model would not represent some SPOs using the mainframe system since data may be input by action points and support points via on-line terminals. In addition, he reinforced the idea that INFOCEN has the capability to provide on-line ad-hoc and status reports to users, making paper copies illustrated in the model applicable only

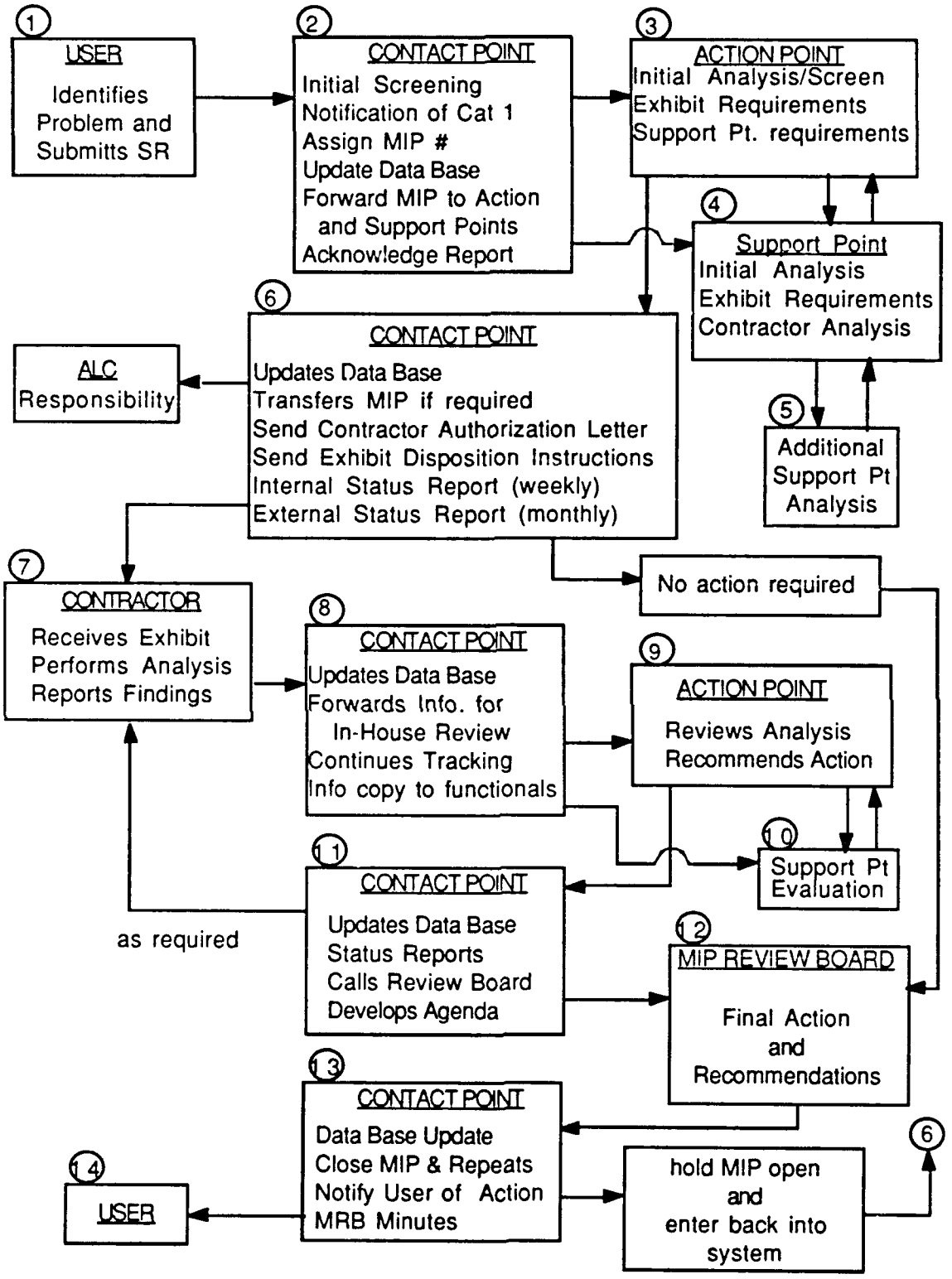


Figure 3. AF-1 Service Reporting Process Model

to the manual or PC based system. In this research effort, the model was successfully used as a tool to describe processes in the office so that specific areas could be targeted for automation improvements.

There are two areas within the AF-1 SR process where large efficiency improvement can be made by implementing the PC based MIS instead of the mainframe based system. As discussed earlier the mainframe system provides excellent storage and sort capabilities; however, it does not provide a good environment for data input or output.

On-line keyboard input to the main frame database system is very unfriendly. All fields in the database are designated by an alphanumerics such as I289 or I190 and are presented to the user in numeric sequence on a single continuous screen. The mainframe input screen does not necessarily present a logical sequence of data fields that may be easily interpreted by the contact point. For example, the contact point is required to search for data input prompts among the several hundred fields. In order to improve the efficiency of the data input process, the PC based MIS can incorporate a more logical, user friendly, approach to data input designed around the AF-1 process model. Separate input screens can be designed to enable the user to more easily determine what information should be placed in the database at each milestone. In addition, the input screen data base field descriptors can be used to more accurately prompt the contact point for the desired input data.

The AF-1 SR process model helps illustrate to the contact point when initial inputs and updates to the data base are made during the MIP lifecycle. There are five distinct stages where information becomes available for input into the database. Theses stages (2, 6, 8, 11, and 13 in the AF-1 process model,

figure 3) correspond to appropriate milestones within the SR process. The database input milestones and contact point stages occur after initial receipt of the SR from the user (stage 2), following initial analysis of the MIP by the action and support points (stage 6), following formal evaluation by the contractor or other support point (stage 8), prior to the MIP review board (stage 11), and after the MRB decision (stage 13). At each of these points there exists a set of fields that should be updated with new MIP information.

The other area of the AF-1 SR process which will likely benefit as a result of a PC MIS is the system output. As discussed in investigative question one, the mainframe system provides output data in the form of standard reports and ad-hoc query reports. This information is valuable to program office managers to help discover trends and to determine the status of MIPs. The PC system, however, is capable of providing more information to a wider variety of people. The MIS can potentially reduce the amount of time a contact point spends preparing internal tasking memorandums, relaying SR deficiency data and investigation results to the action and support points, and preparing other correspondence which tasks and transmits information to external agencies. The AF-1 SR process model includes all documents prepared by the contact point that are both required by the TO such as the SR acknowledgement message and those documents that are used by the PO to maintain internal control of the process such as the official contractor investigation authorization letter.

The SR system can be improved by incorporating into the PC MIS documents that are typically prepared manually to support the storing, investigating, and reporting of MIP information. Unlike the mainframe system, letter quality final draft letters, memos, reports, charts, and DD Form

173 messages can be automated and output by the PC system. The output can be tailored to meet very strict format requirements and individual program office requirements. In general, the output of the PC is much more flexible and of better quality than that output generated by the mainframe.

The AF-1 program office identified several key pieces of SR correspondence which if automated, would greatly reduce the amount of time required to produce and thus improve overall efficiency. Table 3 provides a list of the designated memos, letters, charts, and messages.

TABLE 3

AF-1 Program Office SR Correspondence

Key Internal Correspondence:
Initial Action Point Tasking Memo
Investigation and Analysis Documentation
Initial Support Point Notification
Internal Review and Analysis Action Point Tasking
Support Point Review and Analysis Tasking
MRB Notification Memo
MRB Agenda
MRB Charts
Key External Correspondence:
Message Acknowledging Receipt of SR From Originator
Exhibit Disposition Instructions to Holding Activity
Transfer Responsibility of SR to Other Organization
Contractor Investigation Authorization Letter
MRB Notification Message

As suggested in the methodology section of this thesis, MIS and computer experts were asked to review the AF-1 process model and provide suggestions for improving the list of potential targets for PC automation.

Several new areas not already mentioned were suggested for incorporation into the AF-1 application.

First, PC networking could be incorporated to reduce the amount of actual paperwork sent from one organization to another. The purpose of this network would be to provide another avenue to improve the efficiency of the information flow process between organizations. To implement this communication network all personnel in the PC network, both internal and external to the SPO organization, would require appropriate hardware and software. The network could act in a similar fashion to the mainframe communication network currently established at INFOCEN and also provide an electronic mail system. The data input workload of the contact point could be shifted to the focal points since each one of them could input their particular MIP's historical information into the database. This process should improve the overall accuracy of the information since communication educed errors would likely be reduced. This type of enhancement to the PC system would clearly be desirable; however, the additional hardware, software, and required cooperation among users would require extensive additional time and resources. For these reasons the PC communication network among SR organizations will not be attempted during this research effort.

Another suggestion involved the utilization of Enable's integrated graphics package. Currently the reports associated with service reporting and most of the other SPO management activity are tabular in nature. Enable™ has the capability to produce pie, bar, and line charts from numerical information stored in the database. These charts may offer managers a clearer picture of failure trends, performance measurement, and MIP status. Certainly this type of output should be available if desired by

managers. The graphical output will likely improve the ability of the managers to synthesize information thus improve the overall effectiveness of the SR process.

Data base security is another area which could be incorporated into the SR process. The data base should incorporate some type of password security system to reduce the chance that the data could be altered by non-authorized personnel. Currently, Enable™ does not contain any form of security management; therefore, another software package would have to provide the necessary security control. This package would act externally to Enable™ so it not only would protect the SRMIS application, but all files maintained in the PC.

In pursuit of an answer to investigative question two a great deal of information was produced. The Air Force One service reporting process model is, in itself, a valuable tool that can be used with the TO to guide SPO managers through the complex SR process. This research effort has also identified two particular areas, service reporting data input and output, which if improved in the PC automation process would likely benefit the managers of the SR program.

Investigative Question 3. What PC based MIS can be developed to satisfy the needs identified by investigative question 1 and 2?

Overview. Two broad needs of the program office were identified by the first two investigative questions. First, the SRMIS must replicate many of the mainframe functions to provide a comprehensive system for tracking and investigating material improvement projects. Second, SRMIS

should provide a more efficient and effective system for data input and output.

SRMIS Modeling. This section will discuss the PC based SRMIS which was developed to meet the SR requirements of the AF-1 program office. An overview of the SRMIS models will be provided, followed by a description of the general Enable™ file structure. The database definition will then be discussed to provide a general knowledge of the SRMIS fields. Finally, the input and output files will be reviewed to illustrate the extensive capabilities of the PC based system.

A data flow diagram was developed to show where MIP data originates, is captured, is processed, and is directed after processing. The data flow symbols presented in the literature review (Figure 2) were used to describe the top level data flow relationships between SRMIS and the various organizations. This model was prepared to illustrate the integration of the PC based MIS into the SPO and provide a tool to enhance the prototyping development of the SRMIS with SPO team members. These data flow diagrams closely follow the SR process model developed for investigative question 2. The first model, Figure 4, show the initial submission of the SR to the SPO, the initial evaluation by the action and support points, and the MIP investigation. Figure 5 and Figure 6 illustrate the MIP review board decision making and the SR status reporting processes.

SRMIS Structure. As a result of several months of prototyping with the end user the Enable™ database was created in an attempt satisfy the previously described needs. The SRMIS system is composed of twenty five

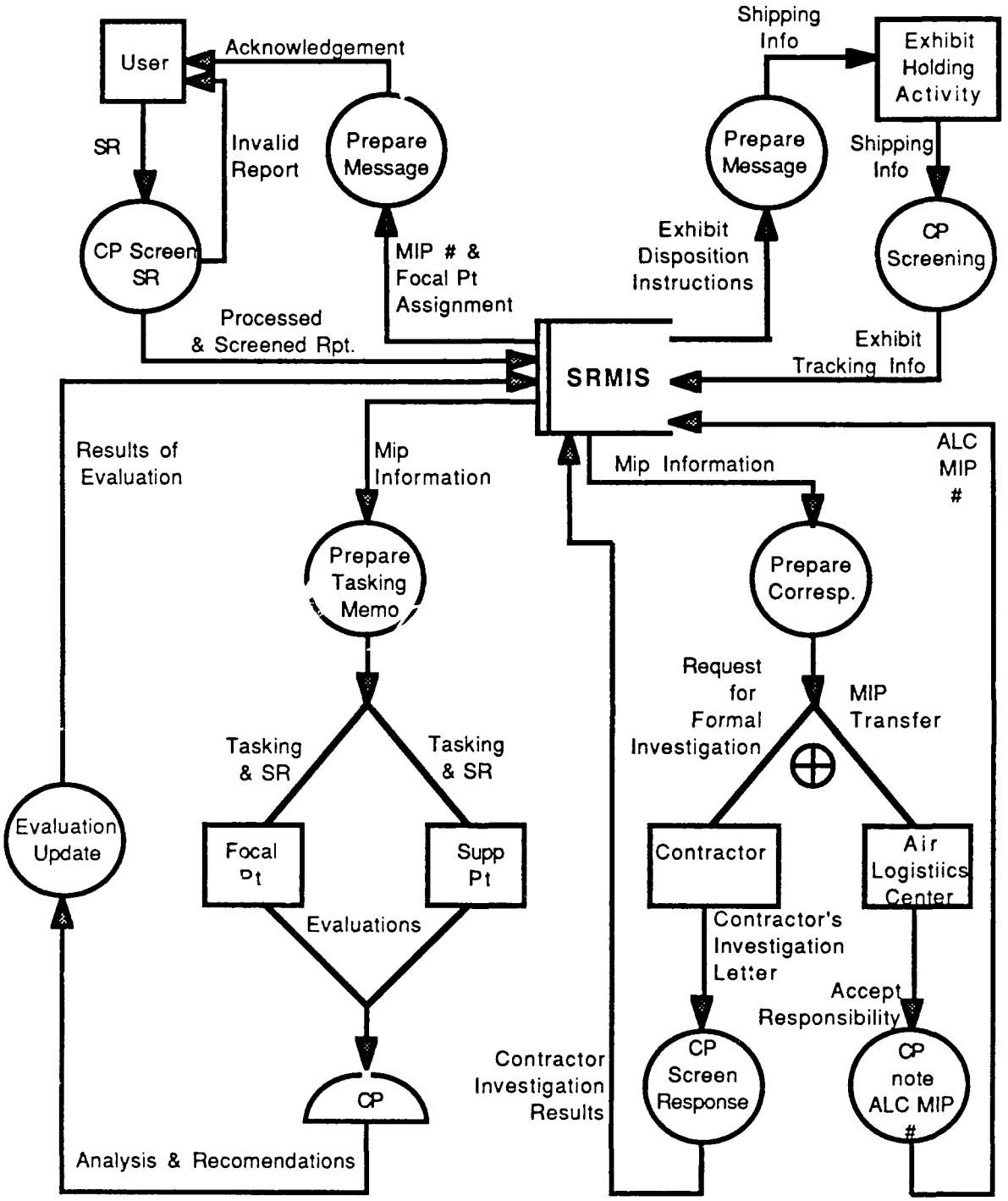


Figure 4. Initial Report, Evaluation, and Investigation Data Flow Diagram

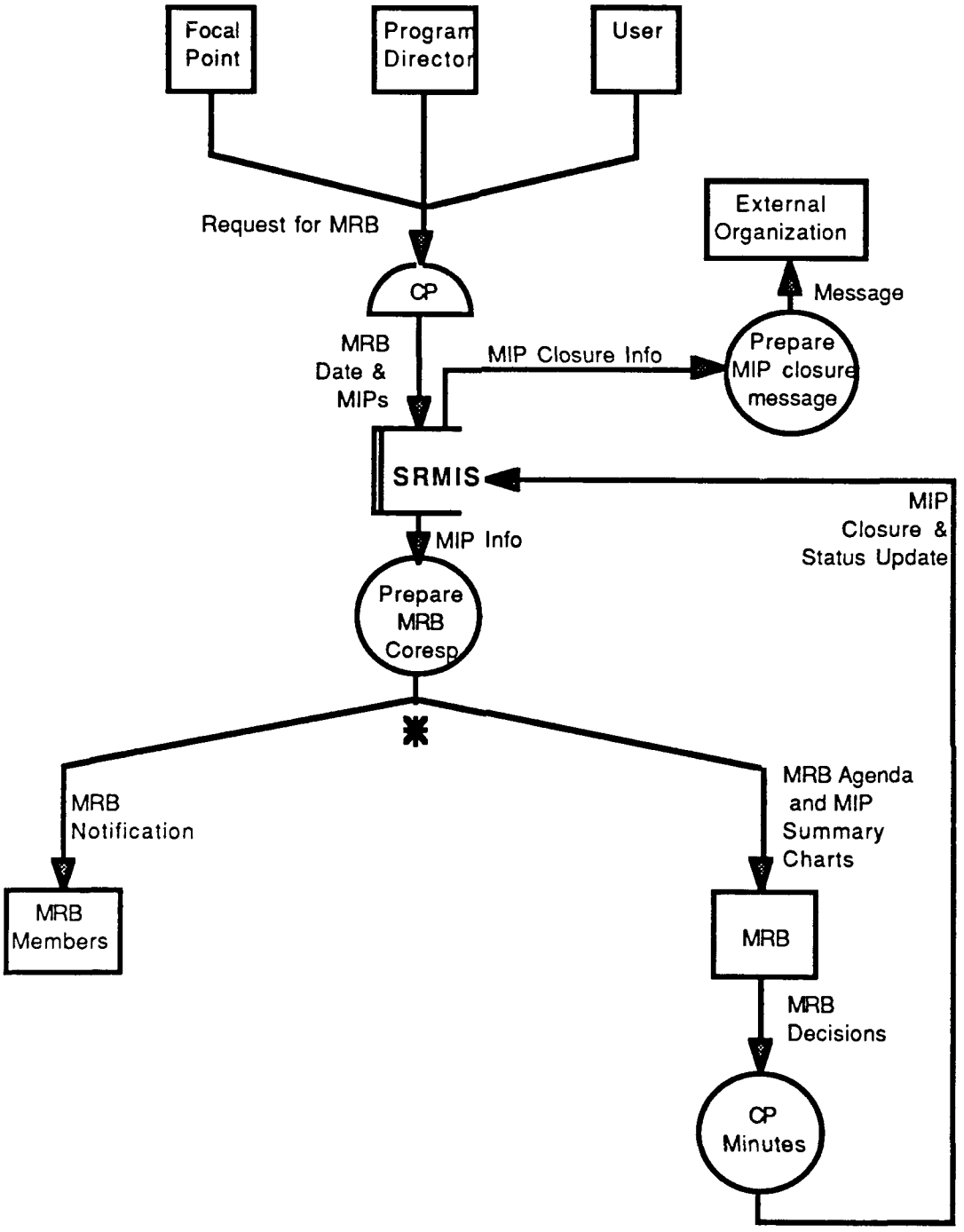


Figure 5. Material Improvement Project Review Board Data Flow Diagram

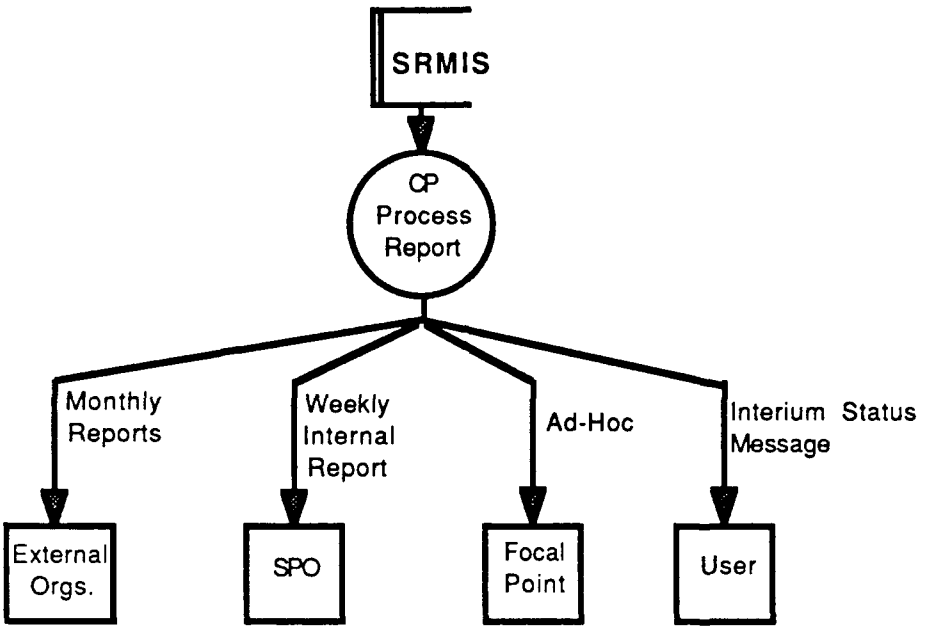


Figure 6. Material Improvement Project Reporting Data Flow Diagram

individual files which provide the Air Force One Replacement Program Office with a completely operational application package.

There are four primary file types used in Enable™. The first three are developed by the designer, in this case the author, prior to data input. The fourth type of Enable™ file is the actual data storage file. A brief explanation of each of the four types of files is provided:

XXXXXXX.$IF - These files are input forms and are designed for the purpose of providing the user a unique data input screen specifically tailored to the particular database. Six input form files have been designed for the SRMIS application.

XXXXXXX.$RF - The Enable™ report form files provide a highly flexible way of producing standard output using information provided from the database, from the screen, from the system, or from information contained in the report

form itself. The user has the option of printing the report to a printer, saving the report to a text file, or displaying the report on the screen.

XXXXXXX.$BF - This file, the database definition, is the heart of the Enable™ database system. The file stores all the information developed by the author to completely define the database and its fields. The single file has been named SRMIS.$BF in this research.

XXXXXXX.DBF - The database file saves all the information the user has input for storage in the database. Each time the SRMIS is updated new information is written to the database storage file.

SRMIS Database Definition. The database definition was developed as a result of the information provided from the mainframe database administrator, the TO, and the interviews. Initially fields from the mainframe system were redefined in the Enable™ database definition. As mentioned previously, some of the mainframe fields were not defined in SRMIS since they were not deemed necessary for the SPO application; other fields were added to meet additional data storage requirements of the SPO. A listing of the SRMIS database definition is provided in Appendix C.

Each field has been labeled with a field name. Those fields beginning with an "I" have maintained the same field name as the mainframe database. The field names beginning with a "J" and followed by a number have been created specifically for the SRMIS database and are not found in the mainframe database. These new fields store a variety of additional information which includes: initial SR data, investigative and tracking details, and additional performance measurement milestone dates. These fields have been defined to provide useful information that is linked to the field name. In

the past, this information either was not maintained, maintained in an additional manual log or filing system, or was buried in the mainframe generic text fields. The new fields provide an additional capability to track and output specific pieces of information rather than an entire text field containing a variety of undesirable information.

There are also fields in the SRMIS database definition which have been indexed to allow sorts. These key fields have been given more user friendly names since they contain information which is output more often than other fields. The Enable™ database software has a limit of ten fields which may be indexed. Because of this restriction, only ten of the more frequently sorted database fields were designated as being indexed. These fields are listed in Table 4.

TABLE 4

SRMIS Indexed Fields

Field	Description
RCN	Report Control Number
NSN	National Stock Number
NOMEN	Nomenclature
MFGPART	Manufacturer's Part Number
WUC	Work Unit Code
STATUS	MIP Status (open or closed)
MIPNUM	MIP Number
FOCAL	SPO Focal Point
INVESTAR	Contractor Investigation Target Date
HOUSETAR	In-house Investigation Review Completion Target Date

There are several methods for generating information which is stored in the database fields. The mainframe system relies on the operator to input all the field information by keyboard. In addition to keyboard entry, SRMIS

has been designed to derive some of its stored information from rules established by the programmer. For example, if a suspense date is normally two weeks from the tasking date then the SRMIS automatically calculates the date on which a reply is expected by adding 14 days to the date on which the particular task was assigned. The SRMIS also contains fields which record information as a result of certain output being generated. In this case, the database definition has been designed to store the current system date when a memo is generated by SRMIS to task focal points. This information is useful since a manager may then have the computer subtract the date from the date of the reply to determine the response time for focal point performance measurement. The ability to automate this type of calculation on one particular MIP does not provide great improvements in the overall efficiency of the system; however, when one considers that this simple calculation may be performed in only a few minutes on all the open investigations within the program office a great time savings and increased visibility can be achieved.

Error messages have also been defined in the database definition. In most cases the field names are nondescriptive; therefore, the Enable™ error messages have been used to provide the user descriptions of the field input. For those fields which require a specific format for input, such as dates, error messages describing the proper format are presented to the operator.

SRMIS Input. The SRMIS context input data flow diagram, Figure 7, illustrates where specific MIP information is gathered for inclusion into the database. There are six primary organizations, both internal and external to the SPO, from which the information is obtained. Normally information is input to the SRMIS from correspondence sent to the SPO

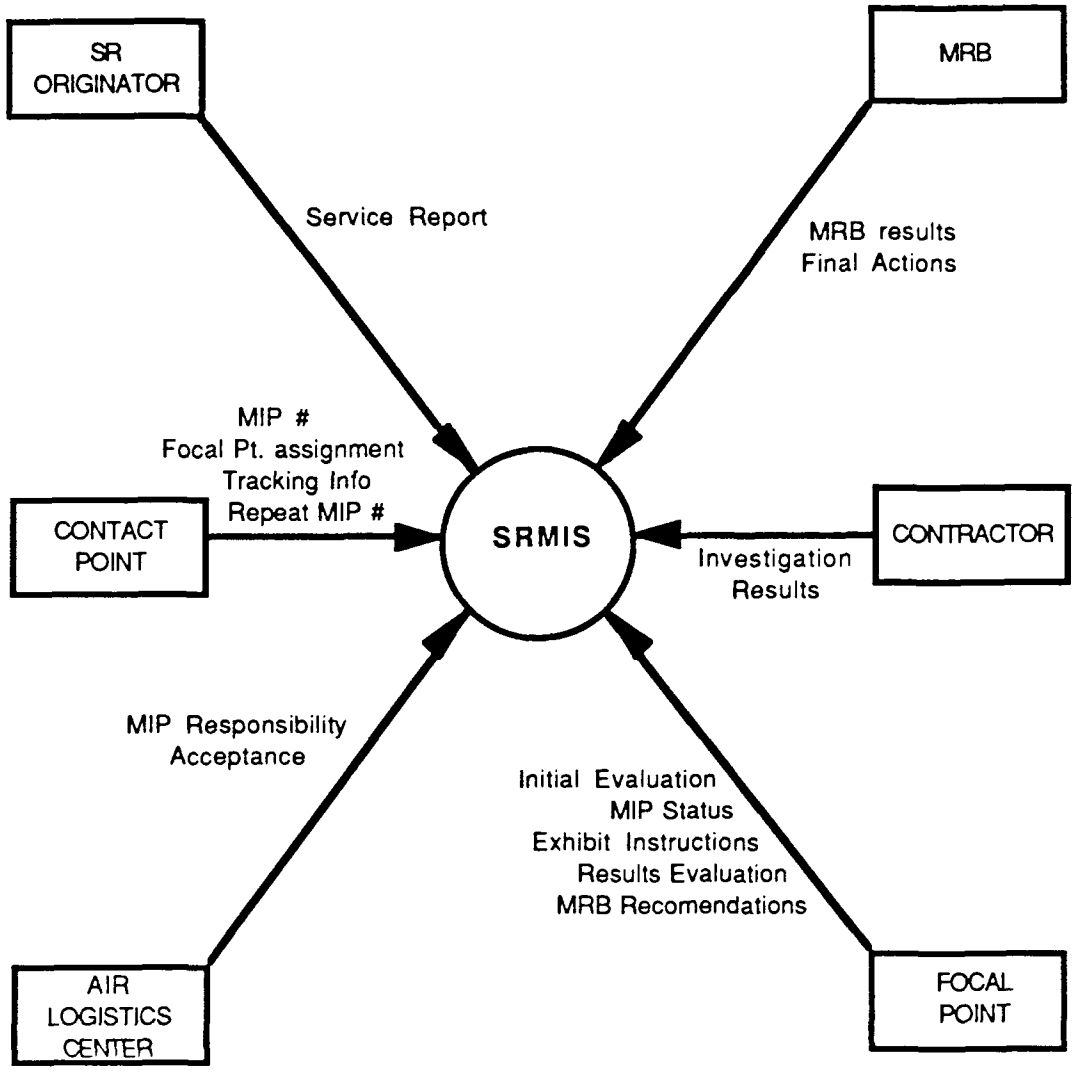


Figure 7. SRMIS Context Input Data Flow Diagram

contact point. In other instances, the MIP information is gathered from internal memorandums specifically designed to collect information from the action and support points for storage and processing in the database. For example, the initial evaluation work sheet generated by SRMIS is filled out by the action point to determine how the MIP investigation will be carried out and then input into SRMIS. Appropriate action may then be taken to

investigate the deficiency. The input data flow diagram shows where among the six sources information is obtained; it does not indicate what methods are used to actually add the information to the database.

The AF-1 process model (Figure 3) developed for investigative question two provided a clear solution as to how the input data was logically divided to provide the contact point a relatively clear method for updating the SRMIS database. Each stage of the contact point's responsibilities (stage 2, 6, 8, 11, and 13) in the process model was associated with an Enable™ data input form. One additional input form has been created to allow input of the service report as it was reported by the originating activity. Therefore, each time a MIP progresses to one of the contact point's stages, input to the database is made via the associated input form. The six SRMIS input forms are provided in Appendix D.

This method of input, using six separate input stages, also provides the user with a built in guide for tracking the MIP. A person unfamiliar with the SR process can review the input screens and know what information should be stored in the database at any given MIP milestone. Each input screen is further divided into subcategories such as MIP information, focal point and support point information, exhibit tracking, and schedule tracking. In addition to the input data flow diagram, Figure 7, these subdivisions provide the contact point with logical clues as to where the information should come from and what information is required to properly track each aspect of the MIP status.

SRMIS Output. The area of service reporting with the greatest potential for obtaining efficiency and effectiveness improvements as

a result of implementing the PC based SRMIS lies in the ability to automate the generation of program office correspondence. There are many documents that lend themselves to automation since they are routine in nature, repetitive, and often follow a very strict format. Investigative questions one and two identified the correspondence (Table 3) that would be needed to meet the requirements of TO 00-35D-54 and the internal controls established by the program office. This section will describe integration of the SRMIS output into the AF-1 program office and provide an overview of the output capabilities of the PC system.

Again looking at the data flow diagrams (Figures 4, 5, and 6) we can see that in order to properly investigate an open MIP a great deal of information must be processed by program office personnel. Specific MIP information is obtained from many different sources and must be disseminated so that all parties become knowledgeable and have the capability to make accurate and timely decisions. The purpose of the SRMIS output is to provide MIP information to a wide variety of recipients so that they can be informed and take appropriate action.

The SRMIS Context Output Data Flow Diagram, Figure 8, illustrates the SRMIS output required by program office personnel and other organizations. Beyond showing the recipients of SRMIS output, the diagram points out an obvious obstacle that must be overcome for the successful implementation of the PC based system. The SRMIS must meet the information processing requirements of many different managers. Each manager has a different task to perform with respect to the SR process and potentially requires a unique set of information at a level of detail which will maximize the use of his time. The program manager, for example, will

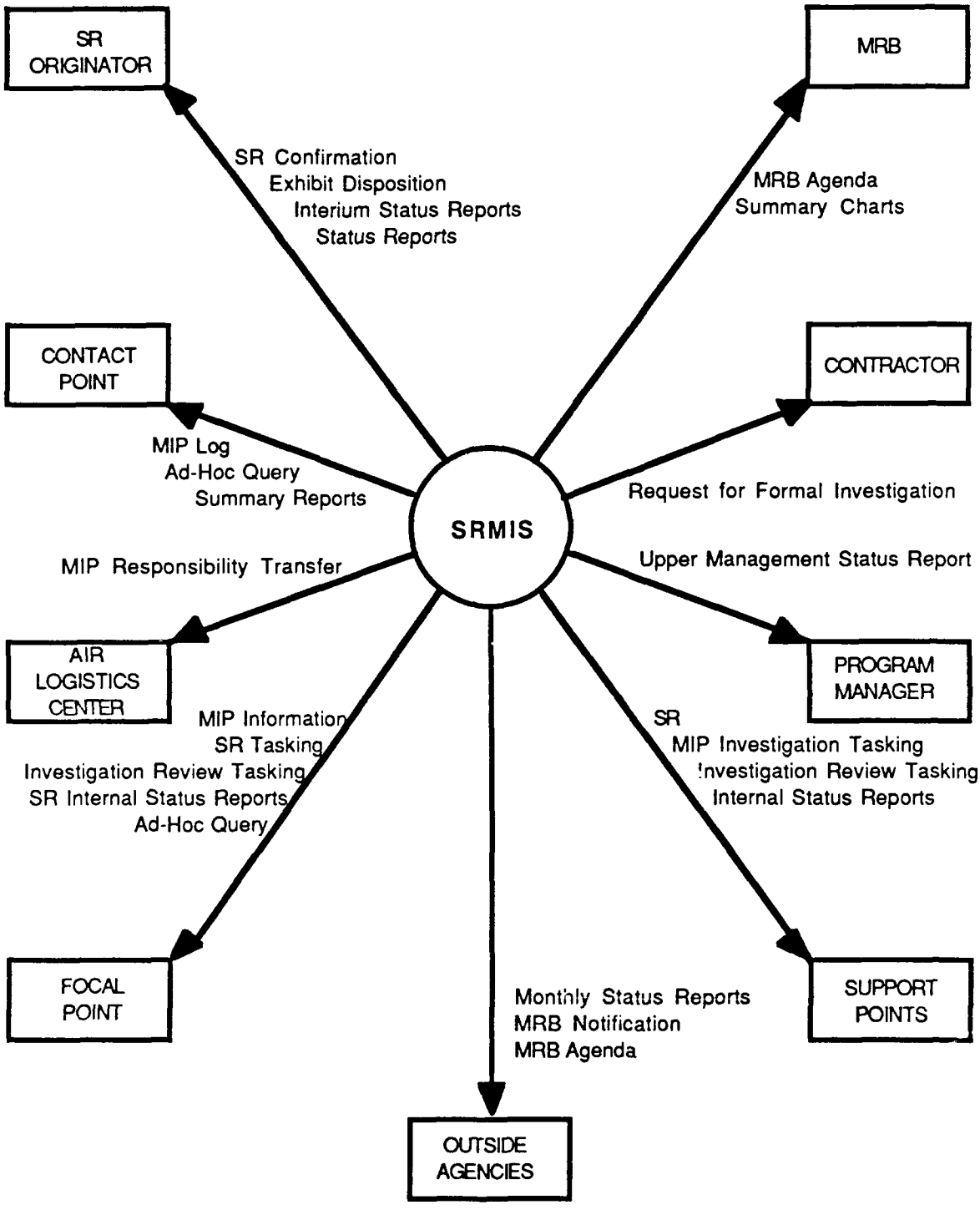


Figure 8. SRMIS Context Output Data Flow Diagram

require a broad overview of all the MIPs while the SR originator may require the specific part shipping information of a single MIP. All output must be developed to meet with the total satisfaction of the recipient. When output is generated for use many people, as in the case of the MIP review board agenda and summary charts, the output should be designed to conform to the standards established by the group. In general, the SRMIS must be flexible and capable of producing many different types of reports and correspondence which will provide accurate and timely information for a wide variety of purposes.

The PC system and the prototyping approach provided an ideal environment for the development of the SRMIS output. Each standard output file produced by SRMIS underwent an extensive evolutionary process to conform to the content requirements of the managers and format requirements established by the TO and other in-house documents. Although the SRMIS package was designed to meet the SR requirements of any small or medium sized SPO, the SRMIS output was designed to meet the more specific needs of the AF-1 program office. The Enable™ output files produced by this research effort provide a person, moderately skilled in the Enable™ reporting language the ability to tailor the AF-1 documents to meet their particular needs.

Fourteen standard outputs have been created to meet the needs of the AF-1 SPO. A list of these documents is provided in Table 5. To integrate SRMIS into the SR process model each output document has been placed into one of the contact point's MIP milestone stages. The SRMIS output table also shows what type of document is produced by each SRMIS file. Unlike the mainframe system which only produces reports, SRMIS produces memos,

TABLE 5

SRMIS Output File Names and Descriptions

STAGE 2:	Type	Enable™ File
Tasking to Focal Point	memo	INITIAL.$RF
Information memos to Support Points	memo	INFO.$RF
Acceptance message to User	message	ACCEPT.$RF
STAGE 6:		
Exhibit disposition instructions	message	EXHIBIT.$RF
Contractor authorization	letter	CONTINV.$RF
Transfer to ALC	message	TRANSFER.$RF
Internal status	report	INTERNAL.$RF
External status	report	EXTERNAL.$RF
Interim status	message	INTERIM.$RF
STAGE 8:		
Contractor results to Action Points	memo	RESULTS.$RF
and Support Points	memo	RESULTS2.$RF
Upper management summary	report	SUMMARY.$RF
Ad-hoc sort	report	
STAGE 11:		
MIP Review Board announcement	message	MRBCALL.$RF
MRB agenda	report	MRBSUM.$RF

messages, letters, and reports. Each output file has been designed to extract specific information from the database, system, or operator and produce a "final copy" document capable of being sent to the recipient. To illustrate the wide variety of output available from the PC application a sample of each of the AF-1 output documents has been included in Appendix D. The appendix contains an example of the final output document produced using the AF-1 database. Each document has been designed to meet the specific reporting

requirements of the TO and also provide additional internal controls for the AF-1 program office.

It is difficult to tell from the documents in Appendix D where specific pieces of information originate and how much automation is actually occurring without studying a listing of each output file. As an example of one of the more complex SRMIS generated documents and perhaps the most difficult to produce, the message providing SR exhibit disposition instructions will be explained in detail.

The DD Form 173 or "message form" is a standard form that, once complete, is used to electronically transfer information from one organization to one or many other external organizations. The message is one method used to provide disposition instructions to the exhibit holding activity. This output, as it relates to the AF-1 SR program and SRMIS, is illustrated in stage six of the AF 1 service reporting process model (Figure 3) and in the right hand corner of the initial report, evaluation, and investigation data flow diagram (Figure 4). Two aspects of the message have been automated. First, the generation of text containing specific disposition instructions relative to the particular MIP has been automated. Second, the precise formatting and printing of the text to the form is computerized by SRMIS. An example of the final output produced using the report form document Exhibit.$RF is located in Appendix E. A listing of the file used to create the output is provided in Appendix F.

To generate the text for the document, information is collected from several sources. The computer application first retrieves the month, year, and date from the operating system to fill in the initial form headings. If the SR has been designated as a category one then the message is made priority or

PP; otherwise the message is routine. The output file then prints the preestablished addressee list. Much like a form letter the subject of the message is filled in based on fields within the database and the individual MIP for which the message references. In this case, the particular aircraft designator(VC-25A) and the MIP category (I or II) is output in the subject line. Relevant MIP information is then output such as the MIP number, report control number, work unit code, nomenclature, serial number, part number and national stock number. The focal point for the particular MIP is then printed at the bottom of the page to identify the originator of the correspondence. Next, the program queries the database to determine if the exhibit instructions have previously been input into the database. If a particular field (I1140) indicates that the exhibit is required for a detailed investigation, then the computer reads further shipping address fields already in the database and outputs the information into the message. If a decision regarding the exhibit instructions has not previously been input into the database then the output file requests input from the screen via the keyboard. Three distinct possibilities are offered. First, no decision has been made and the holding activity should continue to hold the exhibit. Second, the exhibit is required and shipping instructions are typed for output to the message and updated to the database. Or finally, the exhibit is not required for the investigation and can be released. The contact point selects one of the three possibilities, which the focal point has provided, and the instructions are output to the message. Final SRMIS message output is printed directly on the DD Form 173 using a Diablo 630 printer with an OCR font ball. This is the only IBM compatible printer that the author is aware of which will provide the letter quality print necessary to meet the strict standards required for

electronically scanning the completed message. The end product can then be processed for signature and electronic transmission to the exhibit holding activity.

Not all of the SRMIS output is as complicated as the messages. The reports and memos are generally straight forward and easily produced. The formats can be altered to conform to the reporting requirements of individual program offices. These reports are initially requested through the Enable™ database report menu system. A specific report is selected and the sort criteria established. For example, the MRB summary charts are prepared by sorting the MIP status field for "open". Only information concerning the open MIPs will be collected for the charts which are then output on the printer and presented at the MRB for discussion and action.

An unlimited number of non-standard outputs can also be produced for output to disk, screen, or the printer. These ad-hoc reports are often prepared for the focal points or the program manager for investigative, trending, or performance measurement purposes. They may indicate how many individual MIPs a certain focal point has open or provide the engineering status of a particular MIP. These reports can easily become standardized by a particular program office if they write an Enable™ $RF file to store the output format.

Overall, the output files that have been generated for the AF-1 program office provide a flexible system for disseminating MIP information to personnel within the SPO, SR originators, contractors, and other external organizations such as the Air Logistics Centers and higher headquarters. The documents conform to specific TO requirements, are easily generated, and can be altered to meet individual requirements of specific program office

managers. The SRMIS successfully automates SR correspondence that, in the past, was prepared manually by action point and contact point managers.

SRMIS Implementation and Evaluation.

The SRMIS application program was first implemented in the Air Force One program office in March 1990. At the time of initial data input, six service reports had already been transmitted via DD Form 173 from the combined test team at Boeing Military Airplane Company in Wichita, Kansas. The reports described deficiencies discovered on the first aircraft during the initial test phase. Although the SRMIS was not considered in its final form, enough of the core database definition program existed to begin the trial implementation. Input of actual data at this time enhanced the prototyping design approach used to develop the program since preliminary database definitions, input forms, and output forms were used to start the trial. As problems or additional improvements were discovered the programs were updated to reflect the desired configuration. Many iterations of the Enable™ programs were made in an attempt to satisfy the program office's reporting requirements and individual users desires. Over the course of the next four months approximately 50 additional service reports arrived at the program office and were input into the SRMIS.

On one particular occasion, after the SRMIS had reached a near final configuration, 30 reports arrived during a single day. This provided an unexpected opportunity to evaluate the MIS under heavy operating conditions. At this time, the contact point had been operating the system for three months and had become familiar with the SR process and operation of

the SRMIS. The contact point was able to perform the initial screening, input the reports, assign MIP numbers and action points, and output the tasking memos to action and support points (see stage 2 of the AF-1 process control model, Figure 3) after only 6 manhours of work. This effort would otherwise require approximately 12 hours to complete if another system had been used. Because of the fast response time, the MIP information was placed in the hands of the managers so that investigations could begin immediately.

Over the trial period the PC based system was fully implemented in the program office. The system stored all MIP information and produced correspondence used to manage the investigations within the program office. The system was also used to task the prime contractor, report monthly status to external organizations, and transfer MIP responsibility to the Air Logistics Center. During July 1990, the author gathered feedback on SRMIS performance using the Air Force One Program Office SRMIS Feedback Questionnaire, Appendix B. The form was given to the program office personnel involved in the SR process. The responses were overwhelmingly positive with only a few negative comments concerning the system.

The contact point reported that the system was exceptionally easy to use once a general familiarity with the service reporting process and Enable™ had been achieved. Prior to this program the contact had very little experience with Enable™ or service reporting. Within a few days, the contact point was able to store the required MIP information, produce the standardized reports, and track the status of MIPs. The contact point indicated that SRMIS has helped keep her records "organized and up-to-date" and that "as the program office requirements change, the system has the

capability to alter output to meet new requirements." When asked about the additional capabilities, beyond the manual or mainframe service report tracking system, the contact point noted that the flow of information from the MIPs, from beginning to end, had been improved because of the "step-by-step stages" offered in the process model and input forms.

The AF-1 test director, with eleven years of SR experience, provided several comments on the feedback questionnaire. He felt that the SRMIS had been responsive in its ability to assist management track, report, and maintain a historical file of service reports. When asked about efficiency improvements, the test manager indicated that the program office saves "10-20 hours per the life of an SR" over the mainframe or manual tracking systems. In the case of the AF-1 program office, this would amount to an average savings of 750 manhours, given the fifty SR received during the trial implementation phase.

The AF-1 quality assurance manager seemed to be especially pleased with the system's flexibility. Concerning SRMIS's capabilities the manager commented on the ability of the system to be "improved on the spot." When asked if SRMIS provided him with enough information and of the right type, the quality assurance manager said, "yes, if other information is needed it can be programmed."

The Air Force One Acquisition Management Specialist, whose job includes being the SR focal points, said that the system "gave a basic disciplined method for data entry and tracking" and was "definitely better than [a] manual" system. Another project officer stated that the system does assist in tracking the service reports as well as those actions that has been recommended to correct the deficiencies.

The Systems Integration Engineer commented on the support point tasking/response letter saying, "it was easy to use while ensuring that the necessary information is provided to the OPR."

The Air Force One Program Manager also completed the feedback questionnaire. Like the other program office members, the program manager's feedback was very positive. He stated that the system "forced the office to look at the whole SR reporting process as a system and structure it." The program manager also stated that the SRMIS system offered additional capabilities beyond the capabilities provided by the manual or mainframe tracking system. "It improved our effectiveness by allowing the flexibility to make changes as required for unique activities on this program." The manager commented on the summary reports generated by SRMIS saying, they were "excellent for tracking the overall status of the program" and that they were used to prepare a SR briefing to SAF/AQ. Overall the program manager stated that SRMIS was a "[v]ery useful management tool."

When the personnel in the program office were asked if they thought the system would benefit other program offices, every manager indicated "yes." When asked, why, some indicated that by providing the SRMIS program to other program offices they would not have to develop a similar system. Another cited the manpower and dollars saved by implementing the PC based system. The contact point said that the system would benefit other program offices since its "capabilities are well beyond" the manual or mainframe systems and "[e]xtremely flexible." The AF-1 program manager said, "[i]t offers the flexibility to adapt to the unique requirements of each program and would be useful."

On the negative side, one manager disliked the terminologies used to describe the service reporting positions, such as contact point. Although different names could be applied to SPO positions, the terminology is well established throughout the Air Force and explicitly defined in TO 00-35D-54. He also thought that the system did not clearly task personnel since "someone must decide who does what-human decisions must be made." Unfortunately, he is correct. In its current state SRMIS is not an expert system; therefore, does not remove the decision making process from SPO managers. The questionnaire also asked the managers for their recommendations for further improvements in the SRMIS system. The recommendations included developing an easier to read tracking diagram with improved terminologies, integration of an optical scan capability for loading in original messages and contractor analyses, and building in generic SPO SR plans that could be generated by the system. The program manager, like the MIS experts interviewed, remarked that the system could be tied into a PC at the contractor so that information could be transferred electronically. All of these recommendations have merit and are worthy of serious consideration during any future SRMIS improvement efforts.

The HQ AFLC/MMTC manager responsible for establishing USAF MDR and SR policy and procedures was provided with an overview of the SRMIS system and its capabilities by the researcher. The manager said that the system would appear to be useful for smaller SPOs and Air Logistics Center System Program Managers (ALC SPMs) while he thought the mainframe system was the preferred system overall. In addition, he commented on its apparent ability to provide an additional internal tracking capability beyond that of the INFOCEN mainframe database. He did,

however, caution the researcher that SRMIS's inability to provide external users the capability to read and write to the database was a "serious limitation." The HQ AFLC manager also indicated that it was important to very closely mirror the GO21 mainframe database structure so that historical data delivery at Program Management Responsibility Transfer (PMRT) would not be further complicated.

The demonstrations of the completed systems provided further validation of the concept of implementing the PC based MIS in small to medium sized SPOs. A demonstration of the system was provided to three managers responsible for establishing a SR programs in two separate ASD system program offices. The managers received an overview of the capabilities of the MIS which included review of the input forms, processing capabilities, and output documents. After the demonstration and a review of their own reporting requirements, the two managers from ASD/RW, a basket SPO, agreed that the system appeared to be the preferred method for maintaining control of their particular SR program. They informed the researcher that they would like to implement the system in ASD/RW following final approval by program management. The third manager had several years of experience with the extremely large F-16 service reporting system, but was currently the configuration management representative for a special projects program office in ASD. This manager felt that the SRMIS application to smaller program offices offered a very new and interesting approach to programs which did not have quite the magnitude of an F-16 program. The manager went on to say that the SRMIS will significantly improve the SR system currently in her office and that she plans to implement a taylored version of the SRMIS application package.

The ASD service reporting focal point received an overview and demonstration of the SRMIS. The AF-1 process model, input forms, processing capabilities, and output forms were explained in detail by the author. When questioned about possible flaws in the processing or logic used to develop the process control model or SRMIS the manager presented two areas that could be improved.

The first suggestion centered about AF-1 process model and the processing of SRs when the repair of the item is covered under a manufacture's warranty. In this case, the manager suggested that even though a SR was submitted no MIP should be established.; the SR should be ejected from the SR system and forwarded to the warranty manager. However, after review of the TO it was agreed that this was not the case. Warranty items submitted as SRs are investigated and evaluated using the non-warranty procedures, except that there is additional coordination with the warranty manager to ensure warranty provisions are considered. The TO stated that the warranty manager was required to develop additional procedures to resolve these warranty issues. It is clear though that for warranty items additional processing is required beyond that normally provided during the SR tracking, investigating, and reporting system. SRMIS currently has the capability to track the evaluation and resolution of warranty service reports provided the warranty manager establishes warranty procedures tailored to the individual program. The addition of these procedures to the AF-1 SR process model is considered to be beyond the scope of this research.

Second, the ASD manager noted that the AF-1 process model did not indicate any different processing requirements for category 1 or "high

priority" service reports and that SRMIS, although it stored information identifying a category I SR, did not shorten suspense requirements to meet the expedited reporting requirements. In fact, this is a valid point. SRMIS does consider the severity of category 1 service reports in some, but not all, of its processing. For example, when a message is generated to one of the outside organizations via a DD Form 173 SRMIS queries the database to determine if the SR is a category I or II. If the SR is category I then the message is sent out using a "priority" designation; otherwise it is routine. In addition, SRMIS assigns a shorter suspense date for the initial evaluation by the focal and support points. Beyond these measures SRMIS does not alter processing for category one service reports. Additional procedures could be implemented to increase the priority given to exhibit shipments, highlight the reporting of category I SR to managers, and reduce the amount of time allowed for evaluation and recommendation of corrective action. In any future application of the SRMIS application package these additional improvements could easily be added to the output documents to improve the processing of category one SRs.

In general, the ASD focal point for service reporting was impressed with the capabilities of SRMIS. He agreed that data input using the mainframe was not straight forward and that the PC approach implemented a system which improved the efficiency of data input. The manager also commented that SRMIS had effectively automated many of the repetitive internal processes used to report information to internal and external organizations. He appeared especially impressed with SRMIS's ability to generate messages containing the important deficiency data information. The ASD focal point indicated that the application of SRMIS to classified

programs, unable to use the mainframe system, appears to be very promising. In addition, he mentioned that the PC program may also be a viable alternative for service reporting on the B-2 stealth bomber since total acquisition may be reduced to as few as fifteen aircraft.

This section has presented the subjective opinion of individual managers both internal and external to the AF-1 SPO regarding implementation of the PC based service reporting MIS. The concept has been widely accepted as providing both efficiency and effectiveness improvements over the mainframe system. The author believes that these improvements have not been realized solely as a result of the implementation of SRMIS, but because the PC and 4th generation language allow the development of a flexible system which can be rapidly altered to meet the specific goals of the organization.

IV. Conclusions and Recommendations

Overview

The past four chapters presented research designed to develop and implement a PC based MIS in a SPO environment for the purpose of tracking, investigating, and reporting weapon system deficiencies. Currently TO 00-35D-54 suggests implementing one of two possible methods, a manual or mainframe system, to provide the required internal controls necessary to effectively manage the vast amount of technical and support data gathered during a material improvement project's life time. For some organizations, typically smaller system program offices, the two current systems needlessly consume valuable SPO resources. Today smaller SPOs typically do not have the extra manpower positions required to implement a manual system or the monetary resources to establish and maintain the centralized mainframe deficiency reporting system. The personal computer based service reporting management information system (SRMIS) was designed and developed as a more efficient and effective alternative to the two existing systems. A copy of the SRMIS files created for the Air Force One System Program Office is available by mailing a request for the software developed as a result of this research and two blank disks to AFIT/LSC, Wright-Patterson AFB, OH 45433.

The research questions which guided this effort were the following: 1) What SR processes, currently automated by the INFOCEN mainframe system, can be automated using a PC based MIS? 2) What improvements can be made to the SR system by implementing the PC based MIS? 3) What PC based MIS can be developed to satisfy the needs identified by investigative

question 1 and 2? To answer these questions the researcher selected several methods including interviews, questionnaires, prototype development, and trial implementation with feedback. In addition, many people, from computer software development organizations to organizations responsible for implementing SR programs were involved in providing information to facilitate the development of an acceptable computer application package. The researcher hoped that this wide variety of methods and cross section of knowledgeable people would help produce an MIS which would later prove beneficial to other program offices also operating with increasingly limited resources.

Conclusions

Several conclusions may be drawn from the research. First, as a result of the successful implementation of the SRMIS in the Air Force One Replacement Program Office it is evident that a PC based MIS can replace many of the processing capabilities offered by the mainframe SR tracking system. Second, the data indicates that the PC based SRMIS offers efficiency and effectiveness improvements over the mainframe or manual based systems. Third, the SRMIS developed as a result of this research would appear to provide other SPOs, particulary basket program offices, a system which can be tailored to meet their own processing needs. Each of these general conclusions will now be further addressed.

The Air Force One program office implemented the SRMIS to assist SPO managers track, report, and resolve aircraft deficiencies. Each material improvement project established by the program office was maintained in the management information system to provide a historical data bank of technical

information. Because the SRMIS was designed to meet the needs of this system program office not all of the mainframe database fields were selected for inclusion in the PC based system. The SRMIS is flexible enough to add or delete unique fields so that any information may be tracked and reported by SRMIS. Like the mainframe, SRMIS is also capable of producing ad-hoc and standard reports for the purpose of providing information contained in the information system to both external and internal organizations. Any number of standard reports can be produced to help SR decision makers resolve reported deficiencies. SRMIS can also be used to provide ad hoc reports which, among other things, can allow action point managers to determine if failure trends exist among the reported data. In general, with the exception of an on line read or write capability, SRMIS proved that it could be operated as a substitute for the mainframe reporting system.

The PC based system also provides benefits beyond those currently offered by mainframe or manual systems. SRMIS offers a new and unique approach for inputting MIP data. A process model developed during the research was integrated into the structure of SRMIS. This model provides a clear time phased approach for recording and reporting specific data during the lifecycle of a MIP. SRMIS input forms mirror the process model flow to help the SPO contact point logically record MIP data. The PC based system also automates correspondence normally prepared manually by program office personnel. Internal memos, letters to contractors, and electronic messages to external organizations are all produced by SRMIS using detailed information stored in the system. One of the greatest benefits offered by the MIS is its flexibility. Unlike the mainframe, SRMIS can be altered at any time, with little effort, to input data differently, record new information, or

output unique information in order to meet specific or changing SPO requirements. Because of its flexibility and wide range of capabilities SRMIS increases aid provided to managers and offers a more streamlined execution of procedures in the SPO environment.

Based on the comments of SPO personnel, other basket SPO service reporting managers, and the Aeronautical Systems Division and HQ AFLC managers responsible for establishing SR policy and procedures, a PC based service reporting system similar to the one established for the Air Force One program office would likely prove beneficial in other SPO organizations. All of the managers indicated that SRMIS was a viable alternative to the mainframe reporting system for program offices fitting the basket SPO image. The majority of Enable™ files used to produce the SRMIS can be implemented directly in other program offices. The data base definition file (SRMIS.$BF) and the seven input forms (designated by FILENAME.$IF) may be implemented without modification. The standard output forms, designated by FILENAME.$RF, should undergo minor modifications to produce correspondence tailored for a specific program office. These changes are cosmetic in nature and can be made in a matter hours. Additional standard reports can be created to meet any specific reporting and processing requirements. With very little effort and virtually no monetary expenditures, a program office could expect to have a system tailored to meet its individual needs.

Recommendations

Recommendations to HQ AFSC and HQ AFLC. The researcher recommends the following improvements be made to the Service Reporting System:

1. Include the AF-1 process model developed as a result of this research effort in the TO for the purpose of establishing a clear picture of typical SPO SR activities. Without exception, every SR manager who came in contact with the SRMIS research effort wanted a copy of the model. It proved to be an invaluable tool for clearly discussing many details governing management roles, information flows, and process requirements during a MIP lifecycle.

2. Specifically state that PC based SR systems are an acceptable means of recording and reporting SR information. Too many managers are not aware that the PC is not only an alternative method, but an attractive method for processing the mass amounts of MIP data.

3. Adopt a standard PC based system so that organizations have ready made alternative choices. The PC system may then be upgraded or tailored to meet any other reporting or tracking requirements established by the program office.

Recommendations for Further Study. One of the underlying themes of a Total Quality Management (TQM) viewpoint dictates adoption of a principle of continual process improvement. There is clearly a great deal of additional research which could be performed in the service reporting arena. Specifically, the application of PCs and 4th generation software to the management of the SR system is one area ripe for further investigation. As

PCs and their associated software improve in their ability to process increasing amounts of data at faster rates, and as networking and telecommunication becomes more widely practiced in the DOD environment, an even greater number of operations currently performed by mainframe systems can be transferred to PC based systems. End users marked as champions, desiring to be in control of their own systems, will successfully develop these application packages in an attempt to reap efficiency improvements. The role of the researcher is to search for emerging technologies, develop new systems, and methodically evaluate the worth of these systems to end users.

The MIS developed during this effort used a prototyping approach. It has proved successful throughout the development and implementation phase of SRMIS. The process could easily be continued to improve the concepts only just begun in this research. More effort should be expended to further improve and automate the flow of information from its source to the managers who require the information for decision making. The mainframe SR system will undoubtedly remain the standard until a telecommunication networking approach is applied to the PC based SRMIS. Another champion is needed to investigate and provide validity to the many possible future process improvements.

Appendix A: Service Reporting Contact Point Interview Guide

Name:

Office:

Position Title:

Phone Number:

Program(s):

What stage of the program are you in?

Number of people responsible for data entry and file maintenance?

Number of action points?

How many SR has your office received to date?

Approximate number of SRs expected during any given month?

How many of weapon systems will be produced?

When was the first SR received?

What is the expected total duration of SR program?

Number of field unit users?

Location of field unit users?

What type of data tracking system are you currently using to meet the requirements of TO-0035D-54?

Have you documented the internal operating procedures?

Can I have a copy?

How was this system selected?

Did you get some outside assistance to establish the system?

What about training?

Are you meeting the reporting requirements?

What are the systems drawbacks?

What are the system advantages?

Do you think it is effective?

Is the system efficient?

How could the system be improved?

How much money is your office spending to set up and support the system?

Can you provide me with examples of your user, contractor, and internal correspondence?

How is the correspondence produced?

How is the correspondence tracked?

Is the information timely?

Is the format acceptable?

How can the correspondence be improved?

How often is a MIP review board held?

How much time do you spend preparing for the meeting?

What do you do?

How is failure trend analysis performed?

Who does the work?

Does this flow chart represent how your organization operates?

What information is stored in your data base?

Can I have a copy of the format?

Appendix B: Feedback Questionnaire

Air Force One Program Office
Service Reporting Management Information System
Feedback Questionnaire

The purpose of this questionnaire is to provide an evaluation of the SRMIS PC application program. Please provide an answer to each of the following questions.

Job Title:

Years Experience:

Have you had any experience with the SR process before AF-1?

1. Do you feel that the SRMIS system has been responsive to your needs as a manager involved in the AF-1 service reporting process? ow?

2. Has the SRMIS system offered you additional capabilities (effectiveness improvements), beyond those of a manual or mainframe service report tracking system. What are they?

3. Do you believe that the system offers the program office manpower and/or dollar savings (efficiency improvements) over the mainframe or manual tracking system. What are they?

4. Do you think the system would benefit other program offices? Why?

5. What do you dislike about the SRMIS system or the service reporting process?

6. What further improvements in the SRMIS system would you recommend?

7. Does the system output meet your needs and the needs of your organization?

8 Is the output clear?

9 Does it provide you enough information and of the right type?

10. Does the system clearly task personnel and establish reasonable suspenses?

Additional comments:

```
---------------------------------------------------------------------------
FIELD: FOCAL                    SOURCE OF DATA: Keyboard
 INDEXED?: Yes   INDEX FILE: FOCPT
     DATA TYPE: Text                Letters
                Blanks OK?: Yes
                Case Allowed: Both
                Permitted Punctuation:
     MINIMUM LENGTH: 0      MAXIMUM LENGTH: 15
     REPORT HEADING: FOCAL PT
ERROR MESSAGE: NAME OF THE FOCAL POINT
---------------------------------------------------------------------------
FIELD: HOUSETAR                 SOURCE OF DATA: Derived
 INDEXED?: Yes   INDEX FILE: HOUSTAR
     DATA TYPE: Text
     MINIMUM LENGTH:        MAXIMUM LENGTH: 8
REPORT HEADING: TARGET IN-HOUSE
ERROR MESSAGE:
FORMULA: @DATE(@DATE(J230)+14)
---------------------------------------------------------------------------
FIELD: INVESTAR                 SOURCE OF DATA: Derived
 INDEXED?: Yes   INDEX FILE: INVTAR
     DATA TYPE: Text
     MINIMUM LENGTH:        MAXIMUM LENGTH: 8
     REPORT HEADING: INVEST TARGET
ERROR MESSAGE:
FORMULA: @DATE(@DATE(J180)+28)
---------------------------------------------------------------------------
FIELD: MFGPART                  SOURCE OF DATA: Keyboard
 INDEXED?: Yes   INDEX FILE: MFGPARTN
     DATA TYPE: Text                Anything
                Blanks OK?: No
                Case Allowed: Both
                Permitted Punctuation:
     MINIMUM LENGTH: 0      MAXIMUM LENGTH: 20
     REPORT HEADING: MANUF P/N
ERROR MESSAGE: THIS MANUFACTURERS PART NUMBER MAY NOT
HAVE ANY SPACES
---------------------------------------------------------------------------
FIELD: MIPNUM                   SOURCE OF DATA: Keyboard
 INDEXED?: Yes   INDEX FILE: MIPNUM
     DATA TYPE: Text                Numbers+Letters
                Blanks OK?: No
                Case Allowed: Upper
                Permitted Punctuation: -
     MINIMUM LENGTH: 1      MAXIMUM LENGTH: 11
     REPORT HEADING: MIP NUMBER
ERROR MESSAGE: MIP NUMBER (NO SPACES, ALL CAPS)
```

```
---------------------------------------------------------------------------
FIELD: MIPSTATUS                SOURCE OF DATA: Keyboard
     DATA TYPE: Text                 Anything
     MINIMUM LENGTH: 0       MAXIMUM LENGTH: 254
     REPORT HEADING: CURRENT MIP STATUS:
ERROR MESSAGE:
---------------------------------------------------------------------------
FIELD: NOMEN                    SOURCE OF DATA: Keyboard
  INDEXED?: Yes    INDEX FILE: NOMENCLA
     DATA TYPE: Text                 Anything
     MINIMUM LENGTH: 1       MAXIMUM LENGTH: 30
     REPORT HEADING: NOMENCLATURE
ERROR MESSAGE: Nomenclature of reported item
---------------------------------------------------------------------------
FIELD: NSN                      SOURCE OF DATA: Keyboard
  INDEXED?: Yes    INDEX FILE: NATSTOCK
     DATA TYPE: Text                 Anything
     MINIMUM LENGTH: 0       MAXIMUM LENGTH: 20
     REPORT HEADING: NATIONAL STOCK NUM
ERROR MESSAGE: NO SPACES AND USE DASHES(-) LIKE
4510-01-262-2626LH
---------------------------------------------------------------------------
FIELD: RCN                      SOURCE OF DATA: Keyboard
  INDEXED?: Yes    INDEX FILF: REPCONT
     DATA TYPE: Text                 Anything
                Blanks OK?: No
                Case Allowed: Upper
                Permitted Punctuation: -
     MINIMUM LENGTH: 5       MAXIMUM LENGTH: 20
     REPORT HEADING: RCN
ERROR MESSAGE: REPORT CONTROL NUMBER (ALL CAPS AND NO
SPACES)
---------------------------------------------------------------------------
FIELD: STATUS                   SOURCE OF DATA: Keyboard
  INDEXED?: Yes    INDEX FILE: OPENCLOS
     DATA TYPE: Text                 Letters
                Blanks OK?: No
                Case Allowed: Upper
                Permitted Punctuation:
     MINIMUM LENGTH: 0       MAXIMUM LENGTH: 6
     REPORT HEADING: STATUS
ERROR MESSAGE: MIP STATUS (ALL CAPS) "OPEN" OR "CLOSED"
```

```
---------------------------------------------------------------------------
FIELD: WUC                          SOURCE OF DATA: Keyboard
  INDEXED?: Yes    INDEX FILE: WORKCODE
      DATA TYPE: Text                    Numbers+Letters
                 Blanks OK?: No
                 Case Allowed: Upper
                 Permitted Punctuation:
      MINIMUM LENGTH: 0        MAXIMUM LENGTH: 5
      REPORT HEADING: WUC
ERROR MESSAGE: WORK UNIT CODE (MUST BE CAPITAL LETTERS,
NO SPACES)
---------------------------------------------------------------------------
FIELD: I3                           SOURCE OF DATA: System Date
DATA TYPE                    System data supplied during EDIT
      MINIMUM LENGTH: 8        MAXIMUM LENGTH: 8
EDIT PICTURE                      REPORT PICTURE
YY/MM/DD                            YY/MM/DD
      REPORT HEADING: DATE OF LAST EDIT
ERROR MESSAGE: REQUIRED FIELD, DATE OF RECORD EDIT,
YY/MM/DD
---------------------------------------------------------------------------
FIELD: I60                          SOURCE OF DATA: Keyboard
      DATA TYPE: Text                    Numbers+Letters
                 Blanks OK?: No
                 Case Allowed: Upper
                 Permitted Punctuation:
      MINIMUM LENGTH: 2        MAXIMUM LENGTH: 2
LIST OF ACCEPTABLE VALUES?: No
EDIT PICTURE                      REPORT PICTURE
                                  UX
      REPORT HEADING: CAT I/II
ERROR MESSAGE: SHOULD BE "C1" FOR CATEGORY 1 OR "C2" FOR
CATEGORY 2
---------------------------------------------------------------------------
FIELD: I90                          SOURCE OF DATA: Keyboard
      DATA TYPE: Text                    Numbers+Letters
                 Blanks OK?: Yes
                 Case Allowed: Both
                 Permitted Punctuation:
      MINIMUM LENGTH: 0        MAXIMUM LENGTH: 20
      REPORT HEADING: MISHAP NUMBER
ERROR MESSAGE: MISHAP NUMBER
---------------------------------------------------------------------------
FIELD: I120                         SOURCE OF DATA: Keyboard
      DATA TYPE: Other                                    Date
      MINIMUM LENGTH: 8        MAXIMUM LENGTH: 8
EDIT PICTURE                      REPORT PICTURE
YY/MM/DD                            YY/MM/DD
      REPORT HEADING: DATE DEF DISC
ERROR MESSAGE: DATE DEFICIENCY DISCOVERED HAS TO BE
YY/MM/DD
```

```
--------------------------------------------------------------------------------
FIELD: I140                          SOURCE OF DATA: Keyboard
  INDEXED?: No   INDEX FILE: MANUF
      DATA TYPE: Text                     Anything
      MINIMUM LENGTH: 0       MAXIMUM LENGTH: 15
      REPORT HEADING: MANUFACTURER
ERROR MESSAGE:
--------------------------------------------------------------------------------
FIELD: I150                          SOURCE OF DATA: Keyboard
      DATA TYPE: Text                     Numbers+Letters
                 Blanks OK?: Yes
                 Case Allowed: Both
                 Permitted Punctuation:
      MINIMUM LENGTH: 0       MAXIMUM LENGTH: 10
      REPORT HEADING: MFG TRC CODE
ERROR MESSAGE: MFG/OVERHAUL TRC CODE
--------------------------------------------------------------------------------
FIELD: I165                          SOURCE OF DATA: Keyboard
      DATA TYPE: Text                     Anything
                 Blanks OK?: Yes
                 Case Allowed: Both
                 Permitted Punctuation:
      MINIMUM LENGTH: 0       MAXIMUM LENGTH: 15
      REPORT HEADING: SHIPPER
ERROR MESSAGE: SHIPPER
--------------------------------------------------------------------------------
FIELD: I180                          SOURCE OF DATA: Keyboard
      DATA TYPE: Text                     Anything
      MINIMUM LENGTH: 0       MAXIMUM LENGTH: 20
LIST OF ACCEPTABLE VALUES?: No
      REPORT HEADING: SERIAL/LOT/BATCH
ERROR MESSAGE: SHOULD BE SERIAL/LOT/BATCH
--------------------------------------------------------------------------------
FIELD: I190                          SOURCE OF DATA: Keyboard
      DATA TYPE: Text                     Anything
                 Blanks OK?: Yes
                 Case Allowed: Both
                 Permitted Punctuation:
      MINIMUM LENGTH: 0       MAXIMUM LENGTH: 20
      REPORT HEADING: CONTRACT NUM
ERROR MESSAGE: CONTRACT NUMBER
--------------------------------------------------------------------------------
FIELD: I210                          SOURCE OF DATA: Keyboard
      DATA TYPE: Text                     Special
                 Blanks OK?: No
                 Case Allowed: Upper
                 Permitted Punctuation:
EDIT PICTURE                         REPORT PICTURE
U
      REPORT HEADING: ITEM NEW/REP
ERROR MESSAGE: ITEM IS EITHER NEW "N" OR REPAIRED "R"
```

```
---------------------------------------------------------------------------
FIELD: I220                          SOURCE OF DATA: Keyboard
     DATA TYPE: Other                                          Date
     MINIMUM LENGTH: 8       MAXIMUM LENGTH: 8
EDIT PICTURE                        REPORT PICTURE
YY/MM/DD                           YY/MM/DD
     REPORT HEADING: DATE MFGD
ERROR MESSAGE: DATE MANUFACTURED YY/MM/DD
---------------------------------------------------------------------------
FIELD: I230                          SOURCE OF DATA: Keyboard
     DATA TYPE: Numeric    Integer
     MINIMUM LENGTH: 0       MAXIMUM LENGTH: 6
     REPORT HEADING: OPER TIME AT FAIL
ERROR MESSAGE: OPERATING TIME (HOURS) AT FAILURE
---------------------------------------------------------------------------
FIELD: I235                          SOURCE OF DATA: Keyboard
     DATA TYPE: Logical                              Y
                Blanks OK?: No
                Case Allowed:
                Permitted Punctuation:
     MINIMUM LENGTH: 1       MAXIMUM LENGTH: 1
     REPORT HEADING: GFE
ERROR MESSAGE: GOVERNMENT FURNISHED EQUIPMENT (Y or N)
---------------------------------------------------------------------------
FIELD: I266                          SOURCE OF DATA: Keyboard
     DATA TYPE: Numeric    Integer
     MINIMUM LENGTH: 0       MAXIMUM LENGTH: 3
     REPORT HEADING: QUANT REC
ERROR MESSAGE: QUANTITY RECEIVED
---------------------------------------------------------------------------
FIELD: I268                          SOURCE OF DATA: Keyboard
     DATA TYPE: Numeric    Integer
     MINIMUM LENGTH: 0       MAXIMUM LENGTH: 3
     REPORT HEADING: QUAN INSP
ERROR MESSAGE: QUANTITY INSPECTED
---------------------------------------------------------------------------
FIELD: I270                          SOURCE OF DATA: Keyboard
     DATA TYPE: Numeric    Integer
     MINIMUM LENGTH: 0       MAXIMUM LENGTH: 3
     REPORT HEADING: QUAN DEF
ERROR MESSAGE: QUANTITY DEFICIENT
---------------------------------------------------------------------------
FIELD: I280                          SOURCE OF DATA: Keyboard
     DATA TYPE: Text                      Anything
     MINIMUM LENGTH: 0       MAXIMUM LENGTH: 12
     REPORT HEADING: ENDITEM NOMEN
ERROR MESSAGE: END ITEM NOMENCLATURE
```

```
---------------------------------------------------------------------------
FIELD: I290                          SOURCE OF DATA: Keyboard
     DATA TYPE: Text                      Anything
                Blanks OK?: No
                Case Allowed: Upper
                Permitted Punctuation: -
     MINIMUM LENGTH: 0       MAXIMUM LENGTH: 10
     REPORT HEADING: END ITEM S/N
ERROR MESSAGE: END ITEM SERIAL NUMBER (NO SPACES) CAN
USE "-"
---------------------------------------------------------------------------
FIELD: I300                          SOURCE OF DATA: Keyboard
     DATA TYPE: Text                      Anything
                Blanks OK?: Yes
                Case Allowed: Both
                Permitted Punctuation:
     MINIMUM LENGTH: 0       MAXIMUM LENGTH: 25
     REPORT HEADING: NHA NSN
ERROR MESSAGE: NEXT HIGHER ASSEMBLY NATIONAL STOCK
NUMBER
---------------------------------------------------------------------------
FIELD: I302                          SOURCE OF DATA: Keyboard
     DATA TYPE: Text                      Anything
                Blanks OK?: Yes
                Case Allowed: Upper
                Permitted Punctuation:
     MINIMUM LENGTH: 0       MAXIMUM LENGTH: 15
LIST OF ACCEPTABLE VALUES?: No
     REPORT HEADING: NHA NOMEN
ERROR MESSAGE: NEXT HIGHER ASSEMBLY NOMENCLATURE
---------------------------------------------------------------------------
FIELD: I304                          SOURCE OF DATA: Keyboard
     DATA TYPE: Text                      Anything
     MINIMUM LENGTH:         MAXIMUM LENGTH: 12
     REPORT HEADING: NHA P/N
ERROR MESSAGE: NEXT HIGHER ASSEMBLY PART NUMBER
---------------------------------------------------------------------------
FIELD: I306                          SOURCE OF DATA: Keyboard
     DATA TYPE: Text                      Anything
     MINIMUM LENGTH: 0       MAXIMUM LENGTH: 12
     REPORT HEADING: NHA S/N
ERROR MESSAGE: NEXT HIGHER ASSEMBLE SERIAL NUMBER
---------------------------------------------------------------------------
FIELD: I310                          SOURCE OF DATA: Keyboard
     DATA TYPE: Numeric    Currency
     MINIMUM LENGTH: 0       MAXIMUM LENGTH: 7
EDIT PICTURE                    REPORT PICTURE
                                                    N,NNN,NNN.
     REPORT HEADING: UNIT COST
ERROR MESSAGE: UNIT COST IN DOLLARS
```

```
---------------------------------------------------------------------------
FIELD: I315                          SOURCE OF DATA: Keyboard
     DATA TYPE: Numeric     Currency
     MINIMUM LENGTH: 0       MAXIMUM LENGTH: 6
EDIT PICTURE                 REPORT PICTURE
                                                          NNN,NNN.
     REPORT HEADING: EST REPAIR $
ERROR MESSAGE: ESTIMATED DOLLARS TO REPAIR
---------------------------------------------------------------------------
FIELD: I320                          SOURCE OF DATA: Keyboard
     DATA TYPE: Text                      Letters
                Blanks OK?: No
                Case Allowed: Upper
                Permitted Punctuation:
     MINIMUM LENGTH: 0       MAXIMUM LENGTH: 1
     REPORT HEADING: WRNTY
ERROR MESSAGE: IS THE ITEM UNDER WARRANTY? Y or N or U
(unknown)
---------------------------------------------------------------------------
FIELD: I340                          SOURCE OF DATA: Keyboard
     DATA TYPE: Text                      Anything
     MINIMUM LENGTH: 0       MAXIMUM LENGTH: 254
     REPORT HEADING: DETAILS/PROBLEM SUMMARY
ERROR MESSAGE:
---------------------------------------------------------------------------
FIELD: I360                          SOURCE OF DATA: Keyboard
     DATA TYPE: Text                      Numbers+Letters
                Blanks OK?: No
                Case Allowed: Upper
                Permitted Punctuation:
     MINIMUM LENGTH: 0       MAXIMUM LENGTH: 5
     REPORT HEADING: SRD CODE
ERROR MESSAGE: SRD CODE (ALL CAPS)
---------------------------------------------------------------------------
FIELD: I370                          SOURCE OF DATA: Keyboard
     DATA TYPE: Text                      Numbers+Letters
                Blanks OK?: No
                Case Allowed: Upper
                Permitted Punctuation:
     MINIMUM LENGTH: 0       MAXIMUM LENGTH: 2
     REPORT HEADING: CMD CODE
ERROR MESSAGE: COMMAND CODE (APPENDIX A COL 2 OF TO 00-
35D-54
```

```
---------------------------------------------------------------------------
FIELD: I400                          SOURCE OF DATA: Keyboard
  INDEXED?: No   INDEX FILE: MANAGER
      DATA TYPE: Text                    Letters
                 Blanks OK?: Yes
                 Case Allowed: Both
                 Permitted Punctuation:
      MINIMUM LENGTH: 0       MAXIMUM LENGTH: 15
      REPORT HEADING: ALC POC
ERROR MESSAGE: AIR LOGISTICS COMMAND POINT OF CONTACT OR
SPECIALISTS
---------------------------------------------------------------------------
FIELD: I430                          SOURCE OF DATA: Keyboard
      DATA TYPE: Text                    Anything
      MINIMUM LENGTH: 0       MAXIMUM LENGTH: 30
      REPORT HEADING: EXHIBIT HOLDING STATUS
ERROR MESSAGE: EXHIBIT HOLDING STATUS (IE AWAITING
INSTRUCTIONS)
---------------------------------------------------------------------------
FIELD: I440                          SOURCE OF DATA: Keyboard
      DATA TYPE: Text                    Anything
      MINIMUM LENGTH: 0       MAXIMUM LENGTH: 25
      REPORT HEADING: EXHIBIT HOLDING ADDRESS
ERROR MESSAGE: EXHIBIT HOLDING ADDRESS
---------------------------------------------------------------------------
FIELD: I442                          SOURCE OF DATA: Keyboard
      DATA TYPE: Text                    Anything
      MINIMUM LENGTH: 0       MAXIMUM LENGTH: 51
      REPORT HEADING: COGNIZ OFFICAL/PHONE
ERROR MESSAGE: COGNIZANT OFFICIAL / OFFICE SYMBOL / PHONE
NUMBER
---------------------------------------------------------------------------
FIELD: I444                          SOURCE OF DATA: Keyboard
      DATA TYPE: Text                    Anything
      MINIMUM LENGTH: 0       MAXIMUM LENGTH: 50
      REPORT HEADING: CERT OFFICIAL/PHONE NUM
ERROR MESSAGE: CERTIFYING OFFICIAL/ OFFICE / PHONE NUMBER
---------------------------------------------------------------------------
FIELD: I450                          SOURCE OF DATA: Keyboard
      DATA TYPE: Text                    Anything
      MINIMUM LENGTH: 0       MAXIMUM LENGTH: 50
      REPORT HEADING: EQUIP SPECIALIST
ERROR MESSAGE: EQUIPMENT SPECIALISTS/ OFFICE/ PHONE
NUMBER
```

```
---------------------------------------------------------------------------
FIELD: I490                          SOURCE OF DATA: Keyboard
     DATA TYPE: Other                                        Date
     MINIMUM LENGTH: 8       MAXIMUM LENGTH: 8
EDIT PICTURE                        REPORT PICTURE
YY/MM/DD                              YY/MM/DD
     REPORT HEADING: MIP OPENED
ERROR MESSAGE: DATE MIP OPENED YY/MM/DD
---------------------------------------------------------------------------
FIELD: I500                          SOURCE OF DATA: Keyboard
     DATA TYPE: Text                       Anything
     MINIMUM LENGTH: 0       MAXIMUM LENGTH: 14
     REPORT HEADING: MIPS REPEAT THIS MIP
ERROR MESSAGE: MIPS REPEATED TO THIS MIP
---------------------------------------------------------------------------
FIELD: I510                          SOURCE OF DATA: Keyboard
     DATA TYPE: Text                       Anything
     MINIMUM LENGTH: 0       MAXIMUM LENGTH: 14
     REPORT HEADING: THIS MIP REPEATED TO:
ERROR MESSAGE: THIS MIP REPEATED TO MIP NUMBER:
---------------------------------------------------------------------------
FIELD: I540                          SOURCE OF DATA: Keyboard
     DATA TYPE: Text                       Anything
     MINIMUM LENGTH: 0       MAXIMUM LENGTH: 10
     REPORT HEADING: PRIORITY
ERROR MESSAGE: MIP PRIORITY
---------------------------------------------------------------------------
FIELD: I560                          SOURCE OF DATA: Keyboard
     DATA TYPE: Other                                        Date
     MINIMUM LENGTH: 8       MAXIMUM LENGTH: 8
EDIT PICTURE                        REPORT PICTURE
YY/MM/DD
     REPORT HEADING: INT REPLY
ERROR MESSAGE: INITIAL INTERIUM REPLY DATE (YY/MM/DD)
---------------------------------------------------------------------------
FIELD: I630                          SOURCE OF DATA: Keyboard
     DATA TYPE: Text                       Numbers+Letters
                Blanks OK?: Yes
                Case Allowed: Upper
                Permitted Punctuation: /(),
     MINIMUM LENGTH: 0       MAXIMUM LENGTH: 12
EDIT PICTURE                        REPORT PICTURE
                                      U', ('XX'/'XX'/'XX')'
     REPORT HEADING: EXHIB REQ/REQUESTED
ERROR MESSAGE: EXHIBIT REQUIRED (Y OR N) AND THE DATE
REQUESTED
---------------------------------------------------------------------------
```

```
---------------------------------------------------------------------------
FIELD: I640                          SOURCE OF DATA: Derived
     DATA TYPE: Text
     MINIMUM LENGTH:          MAXIMUM LENGTH: 8
     REPORT HEADING: INT REPLY TARGET
ERROR MESSAGE:
FORMULA: @DATE(@DATE(I490)+14)
---------------------------------------------------------------------------
FIELD: I660                          SOURCE OF DATA: Keyboard
     DATA TYPE: Text                      Anything
     MINIMUM LENGTH: 0       MAXIMUM LENGTH: 20
     REPORT HEADING: EXHIBIT SHIPED TO: (NAME)
ERROR MESSAGE: EXHIBIT SHIPED TO: COMPANY NAME
---------------------------------------------------------------------------
FIELD: I662                          SOURCE OF DATA: Keyboard
     DATA TYPE: Text                      Anything
     MINIMUM LENGTH: 0       MAXIMUM LENGTH: 25
     REPORT HEADING: EXHIBIT STREET ADDRESS
ERROR MESSAGE: EXHIBIT STREET ADDRESS
---------------------------------------------------------------------------
FIELD: I664                          SOURCE OF DATA: Keyboard
     DATA TYPE: Text                      Anything
     MINIMUM LENGTH: 0       MAXIMUM LENGTH: 30
     REPORT HEADING: EXHIBIT SHIPPMENT ADDRESS
ERROR MESSAGE: CITY, STATE, ZIP OF EXHIBIT SHIPMENT
---------------------------------------------------------------------------
FIELD: I670                          SOURCE OF DATA: Keyboard
     DATA TYPE: Other                                        Date
     MINIMUM LENGTH: 8       MAXIMUM LENGTH: 8
EDIT PICTURE                    REPORT PICTURE
YY/MM/DD                       YY/MM/DD
     REPORT HEADING: DT EXBT SHIPPED
ERROR MESSAGE: YY/MM/DD DATE EXHIBIT SHIPPED BY
INITIATOR.
---------------------------------------------------------------------------
FIELD: I690                          SOURCE OF DATA: Keyboard
     DATA TYPE: Numeric    Integer
     MINIMUM LENGTH: 0       MAXIMUM LENGTH: 2
     REPORT HEADING: QTY EXBT
ERROR MESSAGE: QUANITY OF EXHIBITS SHIPPED BY INITIATOR
---------------------------------------------------------------------------
FIELD: I710                          SOURCE OF DATA: Keyboard
     DATA TYPE: Other                                        Date
     MINIMUM LENGTH: 8       MAXIMUM LENGTH: 8
EDIT PICTURE                    REPORT PICTURE
YY/MM/DD                       YY/MM/DD
     REPORT HEADING: EXBT REC BY CONTR
ERROR MESSAGE: DATE EXHIBIT WAS RECEIVED BY CONTRACTOR
```

FIELD: I720 SOURCE OF DATA: Keyboard
DATA TYPE: Numeric Integer
MINIMUM LENGTH: 0 MAXIMUM LENGTH: 2
REPORT HEADING: EXBT REC BY CONTR
ERROR MESSAGE: NUMBER OF EXHIBITS RECEIVED BY CONTRACTOR:

FIELD: I740 SOURCE OF DATA: Keyboard
DATA TYPE: Numeric Integer
MINIMUM LENGTH: 0 MAXIMUM LENGTH: 2
REPORT HEADING: EXBT SHIPPED BY CONTR
ERROR MESSAGE: NUMBER OF EXHIBITS SHIPPED BY THE CONTRACTOR

FIELD: I750 SOURCE OF DATA: Keyboard
DATA TYPE: Other Date
MINIMUM LENGTH: 8 MAXIMUM LENGTH: 8
EDIT PICTURE REPORT PICTURE
YY/MM/DD YY/MM/DD
REPORT HEADING: DT EXBT REC BY AF
ERROR MESSAGE: YY/MM/DD EXHIBIT RECEIVED BY AF FOLLOWING INVESTIGATION

FIELD: I760 SOURCE OF DATA: Keyboard
DATA TYPE: Numeric Integer
MINIMUM LENGTH: 0 MAXIMUM LENGTH: 2
REPORT HEADING: EXBT REC BY AF
ERROR MESSAGE: NUMBER OF EXHIBITS RECEIVED BY AF FROM CONTRACTOR.

FIELD: I770 SOURCE OF DATA: Keyboard
DATA TYPE: Other Date
MINIMUM LENGTH: 8 MAXIMUM LENGTH: 8
EDIT PICTURE REPORT PICTURE
YY/MM/DD
REPORT HEADING: EXBT FOLLOW-UP
ERROR MESSAGE: YY/MM/DD OF EXHIBIT FOLLOW UP

FIELD: I850 SOURCE OF DATA: Keyboard
DATA TYPE: Other Date
MINIMUM LENGTH: 8 MAXIMUM LENGTH: 8
EDIT PICTURE REPORT PICTURE
YY/MM/DD
REPORT HEADING: SUPP PT REQUEST
ERROR MESSAGE: YY/MM/DD SUPPORT POINT/ACTION POINT REQUESTED

```
---------------------------------------------------------------------------
FIELD: I860                          SOURCE OF DATA:  Derived
     DATA TYPE:  Text
     MINIMUM LENGTH:                 MAXIMUM LENGTH:  8
     REPORT HEADING:  SUPP PT SUSP DT
ERROR MESSAGE:
FORMULA:  @DATE(@DATE(I850)+14)
---------------------------------------------------------------------------
FIELD: I890                          SOURCE OF DATA:  Keyboard
     DATA TYPE:  Other                                          Date
     MINIMUM LENGTH:  8              MAXIMUM LENGTH:  8
EDIT PICTURE                        REPORT PICTURE
YY/MM/DD                           YY/MM/DD
     REPORT HEADING:  SUPP PT REP DT
ERROR MESSAGE:  SUPPORT POINT REPLY DATE (ACTUAL)
YY/MM/DDD
---------------------------------------------------------------------------
FIELD: I1050                         SOURCE OF DATA:  Keyboard
     DATA TYPE:  Text                     Anything
     MINIMUM LENGTH:  0              MAXIMUM LENGTH:  9
     REPORT HEADING:  ENG ORG
ERROR MESSAGE:  ENGINEERING ORGANIZATION
---------------------------------------------------------------------------
FIELD: I1060                         SOURCE OF DATA:  Keyboard
     DATA TYPE:  Other                                          Date
     MINIMUM LENGTH:  8              MAXIMUM LENGTH:  8
EDIT PICTURE                        REPORT PICTURE
YY/MM/DD                           YY/MM/DD
     REPORT HEADING:  ENG REQUEST
ERROR MESSAGE:  YY/MM/DD ENGINEERING REQUESTED
---------------------------------------------------------------------------
FIELD: I1070                         SOURCE OF DATA:  Keyboard
     DATA TYPE:  Other                                          Date
     MINIMUM LENGTH:  8              MAXIMUM LENGTH:  8
EDIT PICTURE                        REPORT PICTURE
YY/MM/DD                           YY/MM/DD
     REPORT HEADING:  ENG START
ERROR MESSAGE:  DATE ENGINEERING STARTED
---------------------------------------------------------------------------
FIELD: I1090                         SOURCE OF DATA:  Keyboard
     DATA TYPE:  Text                     Anything
     MINIMUM LENGTH:  0              MAXIMUM LENGTH:  25
     REPORT HEADING:  PROJ ENG/PHONE/OFFICE
ERROR MESSAGE:  PROJECT ENGINEER PHONE/OFFICE
```

```
---------------------------------------------------------------------------
FIELD: I1100                    SOURCE OF DATA: Keyboard
     DATA TYPE: Other                                    Date
     MINIMUM LENGTH: 8          MAXIMUM LENGTH: 8
EDIT PICTURE                   REPORT PICTURE
YY/MM/DD                       YY/MM/DD
     REPORT HEADING: ENG TARGET
ERROR MESSAGE: ENGINEERING TARGET DATE
---------------------------------------------------------------------------
FIELD: I1110                    SOURCE OF DATA: Keyboard
     DATA TYPE: Other                                    Date
     MINIMUM LENGTH: 8          MAXIMUM LENGTH: 8
EDIT PICTURE                   REPORT PICTURE
YY/MM/DD                       YY/MM/DD
     REPORT HEADING: ENG COMP DT
ERROR MESSAGE: ENGINEERING COMPLETE DATE
---------------------------------------------------------------------------
FIELD: I1130                    SOURCE OF DATA: Keyboard
     DATA TYPE: Text                  Anything
     MINIMUM LENGTH: 0          MAXIMUM LENGTH: 30
     REPORT HEADING: ENGINEERING INFORMATION
ERROR MESSAGE: ENGINEERING INFORMATION
---------------------------------------------------------------------------
FIELD: I1140                    SOURCE OF DATA: Keyboard
     DATA TYPE: Logical                          Y
     MINIMUM LENGTH: 1          MAXIMUM LENGTH: 1
     REPORT HEADING: TDR REQUEST
ERROR MESSAGE: Y/N TEAR DOWN DEFICIENCY REPORT
REQUESTED?
---------------------------------------------------------------------------
FIELD: I1150                    SOURCE OF DATA: Keyboard
     DATA TYPE: Other                                    Date
     MINIMUM LENGTH: 8          MAXIMUM LENGTH: 8
EDIT PICTURE                   REPORT PICTURE
YY/MM/DD
     REPORT HEADING: TDR TARGET
ERROR MESSAGE: TEAR DOWN REPORT TARGET DATE (YY/MM/DD)
---------------------------------------------------------------------------
FIELD: I1160                    SOURCE OF DATA: Keyboard
     DATA TYPE: Other                                    Date
     MINIMUM LENGTH: 8          MAXIMUM LENGTH: 8
EDIT PICTURE                   REPORT PICTURE
YY/MM/DD
     REPORT HEADING: TDR REPORT
ERROR MESSAGE: TEAR DOWN REPORT DATE
---------------------------------------------------------------------------
FIELD: I1170                    SOURCE OF DATA: Keyboard
     DATA TYPE: Text                  Anything
     MINIMUM LENGTH: 0          MAXIMUM LENGTH: 100
     REPORT HEADING: TDR REPT NARR
ERROR MESSAGE: TEAR DOWN REPORT NARRATIVE
```

```
---------------------------------------------------------------------------
FIELD: I1180                        SOURCE OF DATA: Keyboard
     DATA TYPE: Text                      Anything
     MINIMUM LENGTH: 0      MAXIMUM LENGTH: 15
MINIMUM AND MAXIMUM VALUES?: No
     REPORT HEADING: TDR ACTIVITY:
ERROR MESSAGE: TEAR DOWN ACTIVITY (WHO IS DOING THE
WORK)
---------------------------------------------------------------------------
FIELD: I1190                        SOURCE OF DATA: Keyboard
     DATA TYPE: Other                                      Date
     MINIMUM LENGTH: 8      MAXIMUM LENGTH: 8
EDIT PICTURE                       REPORT PICTURE
YY/MM/DD                          YY/MM/DD
     REPORT HEADING: ECP REQ DT
ERROR MESSAGE: ENGINEERING CHANGE PROPOSAL REQUEST
DATE
---------------------------------------------------------------------------
FIELD: I1200                        SOURCE OF DATA: Keyboard
     DATA TYPE: Other                                      Date
     MINIMUM LENGTH: 8      MAXIMUM LENGTH: 8
EDIT PICTURE                       REPORT PICTURE
YY/MM/DD                          YY/MM/DD
     REPORT HEADING: ECP TARGET DATE
ERROR MESSAGE: ENGINEERING CHANGE PROPOSAL TARGET DATE
---------------------------------------------------------------------------
FIELD: I1210                        SOURCE OF DATA: Keyboard
     DATA TYPE: Other                                      Date
     MINIMUM LENGTH: 8      MAXIMUM LENGTH: 8
LIST OF ACCEPTABLE VALUES?: No
EDIT PICTURE                       REPORT PICTURE
YY/MM/DD                             YY/MM/DD
     REPORT HEADING: ECP REC DT
ERROR MESSAGE: ENGINEERING CHANGE PROPOSAL RECEIVED ON
YY/MM/DD
---------------------------------------------------------------------------
FIELD: I1220                        SOURCE OF DATA: Keyboard
     DATA TYPE: Text                      Anything
     MINIMUM LENGTH: 0      MAXIMUM LENGTH: 10
     REPORT HEADING: ECP NUMBER
ERROR MESSAGE: ENGINEERING CHANGE PROPOSAL NUMBER
---------------------------------------------------------------------------
FIELD: I1230                        SOURCE OF DATA: Keyboard
     DATA TYPE: Other                                      Date
     MINIMUM LENGTH: 8      MAXIMUM LENGTH: 8
EDIT PICTURE                       REPORT PICTURE
YY/MM/DD                                YY/MM/DD
     REPORT HEADING: CCB DATE
ERROR MESSAGE: YY/MM/DD OF CONFIGURATION CONTROL BOARD
```

```
---------------------------------------------------------------------------
FIELD: I1250                    SOURCE OF DATA: Keyboard
     DATA TYPE: Other                                    Date
     MINIMUM LENGTH: 8      MAXIMUM LENGTH: 8
EDIT PICTURE                  REPORT PICTURE
YY/MM/DD                        YY/MM/DD
     REPORT HEADING: CCB APP/DIS
ERROR MESSAGE: YY/MM/DD ECP WAS APPROVED OR
DISAPPROVED VIA CCB
---------------------------------------------------------------------------
FIELD: I1260                    SOURCE OF DATA: Keyboard
     DATA TYPE: Text                 Anything
     MINIMUM LENGTH: 0      MAXIMUM LENGTH: 10
     REPORT HEADING: MOD NUM
ERROR MESSAGE: MODIFICATION NUMBER
---------------------------------------------------------------------------
FIELD: I1270                    SOURCE OF DATA: Keyboard
     DATA TYPE: Text                 Anything
     MINIMUM LENGTH: 0      MAXIMUM LENGTH: 10
     REPORT HEADING: TCTO NUM
ERROR MESSAGE: TCTO NUMBER
---------------------------------------------------------------------------
FIELD: I1290                    SOURCE OF DATA: Keyboard
     DATA TYPE: Logical                      Y
     MINIMUM LENGTH: 1      MAXIMUM LENGTH: 1
     REPORT HEADING: KITS
ERROR MESSAGE: KITS REQUIRED? Y OR N
---------------------------------------------------------------------------
FIELD: I1330                    SOURCE OF DATA: Keyboard
     DATA TYPE: Other                                    Date
     MINIMUM LENGTH: 8      MAXIMUM LENGTH: 8
EDIT PICTURE                  REPORT PICTURE
YY/MM/DD                      YY/MM/DD
     REPORT HEADING: MIP CLOSE DT
ERROR MESSAGE: MIP CLOSED ON YY/MM/DD
---------------------------------------------------------------------------
FIELD: I1340                    SOURCE OF DATA: Keyboard
     DATA TYPE: Text                 Anything
     MINIMUM LENGTH: 0      MAXIMUM LENGTH: 100
     REPORT HEADING: CLOSING SUMMARY:
ERROR MESSAGE: CLOSING SUMMARY
---------------------------------------------------------------------------
FIELD: I1350                    SOURCE OF DATA: Keyboard
     DATA TYPE: Other                                    Date
     MINIMUM LENGTH: 8      MAXIMUM LENGTH: 8
EDIT PICTURE                  REPORT PICTURE
YY/MM/DD                     YY/MM/DD
     REPORT HEADING: CLOSING MSG DT
ERROR MESSAGE: MIP CLOSING MESSAGE DATE
```

```
---------------------------------------------------------------------------
FIELD: I1360                    SOURCE OF DATA: Keyboard
     DATA TYPE: Text                 Anything
     MINIMUM LENGTH: 0      MAXIMUM LENGTH: 100
     REPORT HEADING: INVESTIGATION REPORT STATUS
ERROR MESSAGE: INVESTIGATION REPORT STATUS
---------------------------------------------------------------------------
FIELD: I1380                    SOURCE OF DATA: Keyboard
     DATA TYPE: Text                 Anything
     MINIMUM LENGTH: 0      MAXIMUM LENGTH: 5
     REPORT HEADING: ACTION TAKEN
ERROR MESSAGE: ACTION TAKEN CODE (TCTO, ECP, NONE, CLASSI
OR II)
---------------------------------------------------------------------------
FIELD: I1390                    SOURCE OF DATA: Keyboard
     DATA TYPE: Other                                      Date
     MINIMUM LENGTH: 8      MAXIMUM LENGTH: 8
EDIT PICTURE                  REPORT PICTURE
YY/MM/DD                        YY/MM/DD
     REPORT HEADING: CLOSE TARGET
ERROR MESSAGE: MIIP CLOSE TARGET DATE (YY/MM/DD)
---------------------------------------------------------------------------
FIELD: I1400                    SOURCE OF DATA: Keyboard
     DATA TYPE: Text                 Anything
     MINIMUM LENGTH: 0      MAXIMUM LENGTH: 100
     REPORT HEADING: ACTION SUMMARY
ERROR MESSAGE: ACTION SUMMARY
---------------------------------------------------------------------------
FIELD: I1440                    SOURCE OF DATA: Keyboard
     DATA TYPE: Other                                      Date
     MINIMUM LENGTH: 8      MAXIMUM LENGTH: 8
EDIT PICTURE                  REPORT PICTURE
YY/MM/DD                                              YY/MM/DD
     REPORT HEADING: WARRAN EXP
ERROR MESSAGE: WARRANTY EXPIRATION DATE YY/MM/DD
---------------------------------------------------------------------------
FIELD: I1590                    SOURCE OF DATA: Keyboard
     DATA TYPE: Text                 Anything
     MINIMUM LENGTH: 0      MAXIMUM LENGTH: 254
     REPORT HEADING: ADDITIONAL INFORMATION:
ERROR MESSAGE:
```

FIELD: J10 SOURCE OF DATA: Keyboard
DATA TYPE: Text Numbers+Letters
Blanks OK?: Yes
Case Allowed: Upper
Permitted Punctuation:
MINIMUM LENGTH: 0 MAXIMUM LENGTH: 14
EDIT PICTURE REPORT PICTURE
XXXXXXU UUU XX
REPORT HEADING: ORIG MSG
ERROR MESSAGE: DATE TIME GROUP OF SR NOTIFICATION MESSAGE

FIELD: J20 SOURCE OF DATA: Keyboard
DATA TYPE: Text Numbers+Letters
Blanks OK?: Yes
Case Allowed: Upper
Permitted Punctuation:
MINIMUM LENGTH: 0 MAXIMUM LENGTH: 25
REPORT HEADING: ORIGINATOR
ERROR MESSAGE: ORIGINATOR OF SR MESSAGE

FIELD: J30 SOURCE OF DATA: Keyboard
DATA TYPE: Text Anything
Blanks OK?: Yes
Case Allowed: Upper
Permitted Punctuation:
MINIMUM LENGTH: 0 MAXIMUM LENGTH: 40
REPORT HEADING: SUBJECT
ERROR MESSAGE: SUBJECT OF ORIGIONAL SR NOTIFICATION MESSAGE

FIELD: J40 SOURCE OF DATA: Keyboard
DATA TYPE: Text Anything
Blanks OK?: Yes
Case Allowed: Upper
Permitted Punctuation:
MINIMUM LENGTH: 0 MAXIMUM LENGTH: 20
REPORT HEADING: SOURCE OF REPAIR
ERROR MESSAGE: SOURCE OF REPAIR OR OVERHAUL

FIELD: J50 SOURCE OF DATA: Keyboard
DATA TYPE: Text Anything
MINIMUM LENGTH: 0 MAXIMUM LENGTH: 254
REPORT HEADING: CIRCUM PRIOR
ERROR MESSAGE: CIRCUMSTANCES PRIOR TO DIFFICULTY

```
---------------------------------------------------------------------------
FIELD: J60                          SOURCE OF DATA:  Keyboard
     DATA TYPE: Text                     Anything
     MINIMUM LENGTH: 0              MAXIMUM LENGTH: 254
LIST OF ACCEPTABLE VALUES?: No
     REPORT HEADING:  ACT TAKEN/RECOMEND
ERROR MESSAGE:  ACTION TAKEN AND/OR RECOMMENDED:
---------------------------------------------------------------------------
FIELD: J70                          SOURCE OF DATA:  Keyboard
     DATA TYPE: Text                     Anything
     MINIMUM LENGTH: 0              MAXIMUM LENGTH: 200
     REPORT HEADING:  TECH INFO
ERROR MESSAGE:  TECHNICAL INFORMATION
---------------------------------------------------------------------------
FIELD: J80                          SOURCE OF DATA:  Keyboard
     DATA TYPE: Text                     Anything
     MINIMUM LENGTH: 0              MAXIMUM LENGTH: 41
     REPORT HEADING:  TECH DATA DEF
ERROR MESSAGE:  TECHNICAL DATA DEFICIENCY
---------------------------------------------------------------------------
FIELD: J90                          SOURCE OF DATA:  Keyboard
     DATA TYPE: Text                     Anything
     MINIMUM LENGTH: 0              MAXIMUM LENGTH: 20
     REPORT HEADING:  SUPPORT DATA MAILED
ERROR MESSAGE:  SUPPORT DATA MAILED
---------------------------------------------------------------------------
FIELD: J100                         SOURCE OF DATA:  Keyboard
     DATA TYPE: Text                     Anything
     MINIMUM LENGTH: 0              MAXIMUM LENGTH: 190
     REPORT HEADING:  HOLD ACT
ERROR MESSAGE:  EXHIBIT HOLDING ACTIVITY
---------------------------------------------------------------------------
FIELD: J120                         SOURCE OF DATA:  Keyboard
     DATA TYPE: Text                     Anything
     MINIMUM LENGTH: 0              MAXIMUM LENGTH: 41
     REPORT HEADING:  PHOTO SUPP
ERROR MESSAGE:  PHOTOGRAPHIC SUPPLIES
---------------------------------------------------------------------------
FIELD: J130                         SOURCE OF DATA:  Keyboard
     DATA TYPE: Text                     Anything
     MINIMUM LENGTH: 0              MAXIMUM LENGTH: 160
     REPORT HEADING:  AIRCREW DATA
ERROR MESSAGE:  AIRCREW DATA
---------------------------------------------------------------------------
FIELD: J110                         SOURCE OF DATA:  Keyboard
     DATA TYPE: Text                     Anything
     MINIMUM LENGTH: 0              MAXIMUM LENGTH: 254
     REPORT HEADING:  PERT DATA
ERROR MESSAGE:  PERTINENT DATA
```

```
--------------------------------------------------------------------------------
FIELD: J140                          SOURCE OF DATA:  Keyboard
     DATA TYPE: Other                                      Date
     MINIMUM LENGTH:  8              MAXIMUM LENGTH:  8
EDIT PICTURE                        REPORT PICTURE
YY/MM/DD                           YY/MM/DD
     REPORT HEADING:  SR ACKNOW
ERROR MESSAGE:  YY/MM/DD SR WAS ACKNOWLEDGED BY
MESSAGE
--------------------------------------------------------------------------------
FIELD: J150                          SOURCE OF DATA:  Keyboard
     DATA TYPE: Other                                      Date
     MINIMUM LENGTH:  8              MAXIMUM LENGTH:  8
EDIT PICTURE                        REPORT PICTURE
YY/MM/DD                           YY/MM/DD
     REPORT HEADING:  ASSIGN TO FOCAL
ERROR MESSAGE:  YY/MM/DD SR WAS ASSIGNED TO FOCAL POINT
--------------------------------------------------------------------------------
FIELD: J160                          SOURCE OF DATA:  Keyboard
     DATA TYPE: Other                                      Date
     MINIMUM LENGTH:  8              MAXIMUM LENGTH:  8
EDIT PICTURE                        REPORT PICTURE
YY/MM/DD                           YY/MM/DD
     REPORT HEADING:  Status as of:
ERROR MESSAGE:  MIP Status as of YY/MM/DD.
--------------------------------------------------------------------------------
FIELD: J170                          SOURCE OF DATA:  Keyboard
     DATA TYPE: Text                      Anything
     MINIMUM LENGTH:  0              MAXIMUM LENGTH:  15
     REPORT HEADING:  INVESTIGATOR
ERROR MESSAGE:  MIP INVESTIGATOR (CONTRACTOR)
--------------------------------------------------------------------------------
FIELD: J180                          SOURCE OF DATA:  Keyboard
     DATA TYPE: Other                                      Date
     MINIMUM LENGTH:  8              MAXIMUM LENGTH:  8
EDIT PICTURE                        REPORT PICTURE
YY/MM/DD
     REPORT HEADING:  INVEST TURN ON
ERROR MESSAGE:  YY/MM/DD OF INVESTIGATION AUTHORIZATION
LTR
--------------------------------------------------------------------------------
FIELD: J190                          SOURCE OF DATA:  Keyboard
     DATA TYPE: Text                      Anything
     MINIMUM LENGTH:  0              MAXIMUM LENGTH:  12
     REPORT HEADING:  PCOL #
ERROR MESSAGE:  LETTER NUMBER FOR CONTRACTOR
INVESTIGATION TURN ON
```

```
---------------------------------------------------------------------------
FIELD: J210                          SOURCE OF DATA: Keyboard
     DATA TYPE: Other                                        Date
     MINIMUM LENGTH: 8               MAXIMUM LENGTH: 8
EDIT PICTURE                        REPORT PICTURE
YY/MM/DD                            YY/MM/DD
     REPORT HEADING: INVEST COMP
ERROR MESSAGE: YY/MM/DD CONTRACTOR REPORT OF
INVESTIGATION COMPLETE
---------------------------------------------------------------------------
FIELD: J220                          SOURCE OF DATA: Keyboard
     DATA TYPE: Text                      Anything
     MINIMUM LENGTH: 0               MAXIMUM LENGTH: 12
     REPORT HEADING: LTR #
ERROR MESSAGE: INVESTIGATION LETTER NUMBER
---------------------------------------------------------------------------
FIELD: J230                          SOURCE OF DATA: Keyboard
     DATA TYPE: Other                                        Date
     MINIMUM LENGTH: 8               MAXIMUM LENGTH: 8
EDIT PICTURE                        REPORT PICTURE
YY/MM/DD                            YY/MM/DD
     REPORT HEADING: IN-HOUSE REV
ERROR MESSAGE: YY/MM/DD IN-HOUSE REVIEW OF INVESTIGATION
ASSIGNED
---------------------------------------------------------------------------
FIELD: J250                          SOURCE OF DATA: Keyboard
     DATA TYPE: Text                      Anything
     MINIMUM LENGTH: 0               MAXIMUM LENGTH: 100
     REPORT HEADING: ACTION ITEM
ERROR MESSAGE: ACTION ITEM
---------------------------------------------------------------------------
FIELD: J260                          SOURCE OF DATA: Keyboard
     DATA TYPE: Text                      Letters
                Blanks OK?: Yes
                Case Allowed: Both
                Permitted Punctuation:
     MINIMUM LENGTH: 0               MAXIMUM LENGTH: 15
     REPORT HEADING: ASSIGNED
ERROR MESSAGE: ACTION ITEM ASSIGNED TO:
---------------------------------------------------------------------------
FIELD: J270                          SOURCE OF DATA: Keyboard
     DATA TYPE: Other                                        Date
     MINIMUM LENGTH: 8               MAXIMUM LENGTH: 8
EDIT PICTURE                        REPORT PICTURE
YY/MM/DD                            YY/MM/DD
     REPORT HEADING: DT ASSIGNED
ERROR MESSAGE: YY/MM/DD ACTION ITEM WAS ASSIGNED
```

```
---------------------------------------------------------------------------
FIELD: J280                          SOURCE OF DATA: Keyboard
     DATA TYPE: Other                                    Date
     MINIMUM LENGTH: 8               MAXIMUM LENGTH: 8
EDIT PICTURE                        REPORT PICTURE
YY/MM/DD                            YY/MM/DD
     REPORT HEADING: AI TARGET
ERROR MESSAGE: YY/MM/DD TARGET DATE FOR AI COMPLETION
---------------------------------------------------------------------------
FIELD: J290                          SOURCE OF DATA: Keyboard
     DATA TYPE: Text                      Numbers+Letters
                Blanks OK?: No
                Case Allowed: Upper
                Permitted Punctuation: -
     MINIMUM LENGTH: 0               MAXIMUM LENGTH: 8
     REPORT HEADING: AI #
ERROR MESSAGE: ACTION ITEM NUMBER (ALL CAPS, NO SPACES,
USE "-")
---------------------------------------------------------------------------
FIELD: J300                          SOURCE OF DATA: Keyboard
     DATA TYPE: Text                      Anything
     MINIMUM LENGTH: 0               MAXIMUM LENGTH: 150
     REPORT HEADING: AI RESULTS/STATUS
ERROR MESSAGE: ACTION ITEM RESULTS AND STATUS
---------------------------------------------------------------------------
FIELD: J310                          SOURCE OF DATA: Keyboard
     DATA TYPE: Text                      Anything
                Blanks OK?: Yes
                Case Allowed: Both
                Permitted Punctuation:
     MINIMUM LENGTH: 0               MAXIMUM LENGTH: 100
     REPORT HEADING: FAILURE MODE TITLE:
ERROR MESSAGE: FAILURE MODE TITLE (IE CRACKED FLANGE,
TRANSISTOR R23)
---------------------------------------------------------------------------
FIELD: J320                          SOURCE OF DATA: Keyboard
     DATA TYPE: Text                      Anything
     MINIMUM LENGTH: 0               MAXIMUM LENGTH: 254
     REPORT HEADING: INVESTIGATION RESULTS
ERROR MESSAGE: INVESTIGATION RESULTS
---------------------------------------------------------------------------
FIELD: J330                          SOURCE OF DATA: Keyboard
     DATA TYPE: Text                      Anything
     MINIMUM LENGTH: 0               MAXIMUM LENGTH: 254
     MINIMUM AND MAXIMUM VALUES?: No
     REPORT HEADING: CORRECTIVE ACTION
ERROR MESSAGE: CORRECTIVE ACTION
```

ORIGINAL SERVICE REPORT MESSAGE INPUT

Inputs should be made in lower case letters except that the first letter of names and fields involving both letters and numbers (i.e. Report Control Numbers and Contract Numbers) should be CAPITALIZED.

DATE TIME GROUP OF MESSAGE:_____

1 FROM:_____

SUBJECT:_____ SR CATEGORY:__(I OR II)

MISHAP NUMBER: _____

3 REPORT CONTROL NUMBER: _____

4 DATE DEFICIENCY DISCOVERED:_____

5 NATIONAL STOCK NUMBER:_____

6 NOMENCLATURE:_____

7 MANUFACTURER:_____MANUF CODE:_____SHIPPER:_____

SOURCE OF REPAIR OR OVERHAUL:_____

8 MANUFACTURER PART NUMBER:_____

9 SERIAL NUMBER/LOT NUMBER/BATCH NUMBER:_____

10 CONTRACT, PURCHASE ORDER, DOCUMENT NUMBER:_____

11 ITEM NEW OR OVERHAULED:_____

12 DATE MANUFACTURED, REPAIRED OR OVERHAULED:

13 OPERATING TIME AT FAILURE:_____

14 GOVERNMENT FURNISHED MATERIAL:

15 QUANTITY A. RECEIVED:___B. INSPECTED:___C. DEFICIENT:___

16 DEFICIENT ITEM WORKS ON OR WITH:

A. END ITEM: NOMENCLATURE:_____SERIAL NUMBER:____

B. NEXT HIGHER ASSEMBLY: NSN:_____

NOMENCLATURE:_____

PART NUMBER:_____

SERIAL NUMBER:_____

17 DOLLAR VALUE:_____

18 ESTIMATED CORRECTION COST:_____

19 ITEM UNDER WARRANTY:_____

20 WORK UNIT CODE:_____

21 EXHIBIT DISPOSITION INSTRUCTIONS:

STATUS:_____

ADDRESS:_____

22 DETAILS:

A. CIRCUMSTANCES PRIOR TO DIFFICULTY:_____

B. DESCRIPTION AND CAUSE OF DIFFICULTY: _____

C. ACTION TAKEN AND/OR RECOMMENDED: _____

D. TECHNICAL INFORMATION: _____

E. TECHNICAL DATA DEFICIENCY: _____

F. SUPPORT DATA MAILED: _____

G. STANDARD REPORTING DESIGNATOR (SRD): _____

H. COMMAND CODE: _____

I. OTHER PERTINENT DATA: _____

A. SR EXHIBIT HOLDING ACTIVITY: _____

B. PERTINENT DATA: _____

C. PHOTOGRAPHIC SUPPLIES: _____

D. AIRCREW DATA: _____

J. COGNIZANT OFFICIAL: _____

K. CERTIFYING OFFICIAL: _____

STAGE 2

NOMENCLATURE:_____

MATERIAL IMPROVEMENT PROJECT INFORMATION:

MIP NUMBER ASSIGNED:_____
DATE MIP OPENED:_____
DATE SERVICE REPORT WAS ACKNOWLEDGED TO ORIGINATOR:_____
STATUS:_____(OPEN OR CLOSED)

FOCAL POINT

FOCAL POINT:_____(1st letter Cap others lower case)
DATE ASSIGNED TO FOCAL POINT:_____

SUPPORT POINT:

DATE ASSIGNED TO SUPPORT POINT:_____

ENGINEERING:

ENGINEERING ORGANIZATION: _____
DATE ENGINEERING REQUESTED:_____
DATE ENGINEERING EFFORT STARTED: _____
DATE ENGINEERING EFFORT TARGETED FOR COMPLETION: ___

ADDITIONAL INFORMATION: _____

ACTION ITEM TRACKING:

TITLE OF ACTION ITEM: _____
ACTION ITEM NUMBER: _____
ASSIGNED TO: _____
DATE ASSIGNED: _____
TARGET COMPLETION DATE: _____
STATUS: _____

STAGE 6

MIP NUMBER: _____
NOMENCLATURE: _____

FOCAL POINT EVALUATION:

TARGET COMPLETION DATE FOR THE MIP: _____
THE PRIORITY FOR THIS MIP IS: _____
(ROUTINE/URGENT/EMERGENCY)
FAILURE MODE TITLE: _____

EVALUATION OF THE SR INDICATES AN INVESTIGATION IS NOT REQUIRED FOR THE REASONS STATED BELOW:

A. KNOWN FAILURE MODE. REPEAT TO MIP #: _____
B. ACTION POINT TRANSFER TO: _____

INVESTIGATION INFORMATION:

AN INVESTIGATION SHOULD BE PERFORMED BY: _____
INVESTIGATION INITIATED BY CONTRACT LETTER NUMBER: __

THE DATE OF THE LETTER IS: _____

EXHIBIT INFORMATION:

ANALYSIS OF EXHIBIT REQUIRED?_____(Y OR N)
EXHIBIT DISPOSITION SENT ON:_____
TEAR DOWN REPORTING ACTIVITY (NAME): _____
SHIP EXHIBIT TO: _____
ADDRESS: _____
CITY, ST, ZIP: _____
DATE EXHIBIT SHIPPED: _____
QUANTITY OF EXHIBITS SHIPPED: _____
TEAR DOWN REPORT COMPLETION TARGET DATE: _____

WARRANTY EXPIRATION:

WARRANTY EXPIRATION DATE: _____

MIP SCHEDULE AND TRACKING:

INTERIM MESSAGE SENT TO ORIGINATOR: _____
SUPPORT POINT INITIAL REPORT DATE (ACTUAL): _____
INITIAL ENGINEERING EVALUATION COMPLETION DATE: __
ENGINEERING EVALUATION: _____
_____
_____

MIPS REPEATED TO THIS MIP: _____

ADDITIONAL INFORMATION: _____
_____
_____

ACTION ITEM TRACKING:

TITLE OF ACTION ITEM: _____
ACTION ITEM NUMBER: _____
ASSIGNED TO: _____
DATE ASSIGNED: _____
TARGET COMPLETION DATE: _____
STATUS: _____
_____

STAGE 8

MIP NUMBER: _____
NOMENCLATURE: _____

EXHIBIT TRACKING:

DATE EXHIBIT WAS RECEIVED BY CONTRACTOR: _____
QUANTITY OF EXHIBITS RECEIVED BY THE CONTRACTOR: ___

SUPPORT POINT'S INVESTIGATION RESULTS:

INVESTIGATION COMPLETION DATE: _____
INVESTIGATION REPORT LETTER NUMBER: _____
INVESTIGATION REPORT DATE: _____
TEAR DOWN REPORT NARRATIVE: _____
_____

IN - HOUSE REVIEW OF INVESTIGATION:

DATE IN-HOUSE REVIEW STARTED/TASKED: _____
MIPs REPEATED TO THIS MIP: _____
TARGET CLOSURE DATE: _____

CURRENT MIP STATUS: _____

STATUS AS OF: _____
STATUS: _____(OPEN OR CLOSED)

EXHIBIT FOLLOW-UP:

DATE EXHIBIT RETURNED TO/RECEIVED BY GOVERNMENT: ___
QUANTITY OF EXHIBITS RECEIVED BY GOVERNMENT: _____
EXHIBIT FOLLOW-UP DATE: _____

ADDITIONAL INFORMATION: _____
_____

ACTION ITEM TRACKING:

TITLE OF ACTION ITEM: _____
ACTION ITEM NUMBER: _____
ASSIGNED TO: _____
DATE ASSIGNED: _____
TARGET COMPLETION DATE: _____
STATUS: _____

STAGE 11

MIP NUMBER: _____
NOMENCLATURE: _____

INVESTIGATION:

MIPS REPEATED TO THIS MIP: _____
INVESTIGATION REPORT STATUS: _____
RECOMMENDED CORRECTIVE ACTION: _____
_____
ADDITIONAL ENGINEERING INFORMATION: _____
_____
NEW MIP CLOSURE TARGET DATE: _____

ACTION TO BE TAKEN TO CLOSE MIP:

ACTION SUMMARY: _____
_____
_____
ECP REQUEST DATE: _____
ECP TARGET DATE: _____
ECP RECEIVED ON: _____
ECP NUMBER: _____
TARGET MIP BOARDING DATE: _____

CURRENT MIP STATUS: _____

STATUS AS OF: _____
STATUS: _____(OPEN OR CLOSED)

FINAL ACTION TAKEN:

_____(ECP, TCTO, NONE, CLASS I OR CLASS II MOD ETC)

ADDITIONAL INFORMATION: _____
_____

ACTION ITEM TRACKING:

TITLE OF ACTION ITEM: _____
ACTION ITEM NUMBER: _____
ASSIGNED TO: _____
DATE ASSIGNED: _____
TARGET COMPLETION DATE: _____
STATUS: _____

STAGE 13

MIP NUMBER: _____
NOMENCLATURE: _____

INVESTIGATION:

MIPS REPEATED TO THIS MIP: _____

ACTION TAKEN:

CCB APPROVAL/DISAPPROVAL DATE: _____
MODIFICATION NUMBER: _____
TCTO NUMBER: _____
KITS: _____(Y OR N)

CLOSURE INFORMATION:

MIP CLOSURE DATE: _____
CLOSING SUMMARY: _____
_____
CLOSING MESSAGE DATE: _____

CURRENT MIP STATUS: _____
_____
STATUS AS OF: _____
STATUS: _____ (OPEN OR CLOSED)

ADDITIONAL INFORMATION: _____
_____
_____

ACTION ITEM TRACKING:

TITLE OF ACTION ITEM: _____
ACTION ITEM NUMBER: _____
ASSIGNED TO: _____
DATE ASSIGNED: _____
TARGET COMPLETION DATE: _____
STATUS: _____

Appendix E: SRMIS Output Forms

INITIAL.$RF
Initial Tasking of Focal Point

MEMO TO: ASD/SDCB (Craig Cassino) July 18, 1990

SUBJECT: AF-1 Material Improvement Project (MIP)

1. The attached MIP is forwarded for your action. MIP #DCB-89-005 has been assigned for investigation. Request you perform an initial evaluation of the SR/MIP and recommend further action. Please return the attached SR action form to the SR contact point, Mrs. Kim Howell, by July 25, 1990 in order that we may meet our reporting suspense to the originating activity.

2. Please coordinate any desired changes in suspense with the SR contact point.

3. Request the attached preprinted evaluation form be completed and returned.

Kim Howell
AF-1 SR Contact Point
Directorate of Transports

2 Atch
1. Service Report
2. Evaluation Form

Initial Focal Point Evaluation Form

Request you reply to the first three statements then place an X in the blank next to the applicable actions stated in section 4. Provide additional comments at the bottom of the form if additional action is required.

1. The target completion date for the MIP is: _____.

2. The priority for this MIP is routine / urgent / emergency
(circle one)

3. The inital failure mode title is: _____.

4 Further action required:

_____Evaluation of the SR indicates an investigation is not required for one of the following reasons:

_____This is a known failure mode and the SR should be repeated to MIP #_____.

_____This MIP is not our offices responsibility and should be transfered to: _____.

_____An evaluation of the SR indicates an investigation is required and should be performed by: _____.

_____Exhibit requirements:

_____Analysis of exhibit is required.

Send exhibit to:
company name:
POC at company:
address:
city, state, zip:

_____Exhibit requirements are unknown, hold exhibit for 30 days.

_____Exhibit is not required. Release exhibit to supply system.

_____This item is under warranty with an expiration date of: _____.

5. Additional comments. _____

INFO.$RF
Initial Tasking of Support Points

MEMO TO: SDCC SDCD SDCE SDCBL SDCT July 18, 1990

SUBJECT: AF-1 Material Improvement Project (MIP)

1. The attached MIP is forwarded for your information. Craig Cassino is currently reviewing the MIP and performing an initial evaluation to determine further action. MIP #DCB-89-005 has been assigned for investigation. Request you also review the SP/MIP and provide applicable comments to the action point, Craig Cassino, by **July 25, 1990** in order that our reporting suspense requirements to the originating activity may be met.

2. Please coordinate any desired changes in suspense with the SR contact point, Mrs. Kim Howell, 55017.

Kim Howell
AF-1 SR Contact Point
Directorate of Transports

1 Atch
Service Report

1st Ind ( )

To: SDCB (Craig Cassino)

Evaluation of the SR indicates:

( ) No action or recomendations are required by this office.

( ) An investigation should be performed by the contractor.

( ) The exhibit, if available, should be sent to:

( ) SR responsibility should be transfered to:

( ) Initial evaluation by this office has determined that:

ACCEPT.$RF
Acceptance Message to User

JOINT MESSAGE FORM | UNCLASSIFIED

01 02 | AUG | 90 | RR | RR | UUUU | HQWE271627

FROM: ASD WRIGHT PATTERSON AFB OH//SDC//

TO: AFPRO BOEING CO WICHITA KS//TM/XP/FO/EP/QA//

INFO HQ MAC SCOTT AFB IL//XPT/XRS/LGM/LGMUB/SE/
DOV/IGF/MAQ//
89MAW ANDREWS AFB MD//PPO/MAOP/MAQ/SE//
49SOTEST& WRIGHT PATTERSON AFB OH//DOB/DOBF/FFDS//
USAF ALCENT POPE AFB NC//TE//
HQ AFLC LOC WRIGHT PATTERSON AFB OH//ATS//
SAF WASHINGTON DC//AQQL//
HQ AFSC ANDREWS AFB MD//XRC//
DIR MAT MGT TINKER AFB OK//MMA/MMAM/MMSRA/QA/
MMEDT//
HQ AFOTEC KIRTLAND AFB NM//TEZ//

ACCT AF-ACXJRF

UNCLAS

AFPRO: PLEASE PASS A COPY TO DAVE CHABOTY, BUILDING 23L, K70-35
VC-25A COMBINED TEST TEAM, 526-0031

SUBJECT: AF-1 CAT II SERVICE REPORT

REFERENCE YOUR MESSAGE, 221842 NOV 89

PRIORITY ROUTINE

CRAIG CASSINO
ASD/SDCB, 55017

UNCLASSIFIED

ACCEPT.$RF continued
Acceptance Message to User

JOINT MESSAGE FORM						UNCLASSIFIED				
02 02		AUG	90	RR	RR	UUUU				HQWE271631

1. ASD/SDCB ~~FROM~~ ACKNOWLEDGES RECEIPT OF THE SR AND ASSIGNS THE FOLLOWING ~~TO~~ MIP NUMBER: DCB-89-005

RCN: AF1CTT-89-0005 S/N: N/A

WUC: MFG P/N: N/A

NOM: NBSVT EMERGENCY MODE

NSN: N/A

ASD/SDCB MIP MONITOR WILL BE CRAIG CASSINO, AUTOVON 785-5017.

2. WE WILL PERFORM AN ANALYSIS TO DETERMINE THE CAUSE OF THE DEFICIENCIES. YOU WILL BE ADVISED OF THE RESULTS OF THE INVESTIGATION.

3. 4950TESTW WILL PROVIDE ASD/SDCB AND AFPRO BOEING WITH EXHIBIT SHIPPING INVOICE FOR TRACKING PURPOSES, IF APPLICABLE.

4. REQUEST AFPRO//TM/XP/FO/EP// MONITOR BOEING MILITARY AIRPLANE CO DURING THEIR INVESTIGATION. PCO LETTER TO FOLLOW, IF APPLICABLE.

UNCLASSIFIED

EXHIBIT $RF
Exhibit Disposition Instructions to User

JOINT MESSAGE FORM						UNCLASSIFIED				
01 02		AUG	89	RR	RR	UUUU				HQWE271723

FROM: ASD WRIGHT PATTERSON AFB OH//SDC//

TO: AFPRO BOEING CO WICHITA KS//495DTESTW/CTT//

INFO HQ MAC SCOTT AFB IL//XPT/XPQ/LGM/LGMWB/SE/
DOV/IGF/MAQ//
89MAW ANDREWS AFB MD//PPO/MAOP/MAQ/SE//
495DTESTW WRIGHT PATTERSON AFB OH//DOB/DOBF/FFDS//
HQ AFLC LOC WRIGHT PATTERSON AFB OH//ATS//
DIR MAT MGT TINKER AFB OK//JMMA/MMSGS/MMSRA/QA/
MMEDT//

ACCT AF-ACXJRF

UNCLAS

AFPRO: PLEASE PASS A COPY TO DAVE CHABOTY, BUILDING 23L,
VC-25A COMBINED TEST TEAM, 526-0031

SUBJECT: EXHIBIT DISPOSITION FOR AF-1 CATII SERVICE REPORT

REFERENCE YOUR MESSAGE, 221842 NOV 89

PRIORITY ROUTINE

1. MIP NUMBER: MIP DCB-89-005

RCN: AF1CTT-89-0005 S/N: N/A

WUC: MFG P/N: N/A

NOM: ABSVT EMERGENCY MODE

CRAIG CASSINO
ASD/SDCB, 55017

UNCLASSIFIED

EXHIBIT.$RF continued
Exhibit Disposition Instructions to User

JOINT MESSAGE FORM						UNCLASSIFIED				
02 02		AUG	90	RR	RR	UUUU				HQWE271635

NSN: ~~FREM~~

AID/SDCB MIPO MONITOR IS CRAIG CASSINO, AUTOVON 785-5017.

2. AN ANALYSIS OF THE EXHIBIT WILL BE MADE. SHIP THE EXHIBIT TO THE FOLLOWING ADDRESS USING THE FASTEST TRACEABLE MEANS.

LOCKHEED

JOHN SMITH

111 SOUTH COBB DRIVE

MARIETTA, GA. 34542

UNCLASSIFIED

CONTINV.$RF
Contractor Authorization for Investigation

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS AERONAUTICAL SYSTEMS DIVISION (AFSC)
WRIGHT-PATTERSON AIR FORCE BASE, OHIO 45433-6503

REPLY TO ATTN OF: SDCK-90-123

SUBJECT: Contract F33657-86-C-0039, Air Force One (AF-1) Replacement Program, Service Report Investigation for MIP DCB-89-005, NBSVT Emergency Mode

TO:

Boeing Military Airplane Company
ATTN: Mr. Duane E. VanCamp
Mail Stop K04-56
P.O. Box 7730
Wichita, KS 67277-7730

1. Request you perform an investigation to determine the cause of the deficiency described in the attached Service Report (SR). Please provide a recommendation for corrective action IAW CDRL 3027, AF-1 Contract F33657-86-C-0039.

2. Future correspondence should reference this service report as: MIP Number DCB-89-005, NBSVT Emergency Mode.

3. This letter is issued with the understanding it does not constitute a change in contractual requirements and you are cautioned against performing any out-of-scope effort or incurring unauthorized costs in connection with the contents of this letter. If you are not in agreement with this understanding, you should notify the undersigned, in writing, within ten (10) calendar days of receipt hereof and consider this letter to be null and void from its inception. Failure to notify as provided herein shall constitute your concurrence with this understanding.

4. Program Office SR Project Officer is Craig Cassino ASD/SDCB, (513) 255-5017. For contract matters, contact Ms Noreen Bennett, (513) 255-2333.

1 Atch
Service Report

cc: OC-ALC/MMAM
AFPRO/DET 34

BIRTHPLACE OF AVIATION

TRANSFER.$RF
Transfer MIP Responsibility

JOINT MESSAGE FORM					UNCLASSIFIED				
01 04		AUG	90	RR	RR	UUUU				HQWE271652

FROM: ASD WRIGHT PATTERSON AFB OH//SDC//

TO: DIR MAT MGT TINKER AFB OK//JMMA/MMSGG//

INFO HQ MAC SCOTT AFB IL//XPT/XRS/LGM/LGMWB/SE/
DOV/IGF/MAQ//

89MAW ANDREWS AFB MD//PPO/MAOP/MAQ/SE//

4950TESTW WRIGHT PATTERSON AFB OH//DOB/DOBF/FFDS//

USAF ALCENT POPE AFB NC//TE//

HQ AFLC LOC WRIGHT PATTERSON AFB OH//ATS//

SAF WASHINGTON DC//AQQL//

HQ AFSC ANDREWS AFB MD//XRC//

DIR MAT MGT TINKER AFB OK//MMA/MMAM/MMSRA/QA/
MMEDT//

AFPRO BOEING CO WICHITA KS//TM/XP/FO/EP/QA//

HQ AFOTEC KIRTLAND AFB NM//TEZ//

ACCT AF-ACXJRF

UNCLAS

AFPRO: PLEASE PASS A COPY TO DAVE CHABOTY, BUILDING 23L, K70-35

VC-25A COMBINED TEST TEAM, 526-0031

SUBJECT: AF-1 CAT II SERVICE REPORT TRANSFER

REFERENCE ORIGIONAL MESSAGE, 221842 NOV 89

CRAIG CASSINO
ASD/SDCB, 55017

UNCLASSIFIED

TRANSFER.$RF continued
Transfer MIP Responsibility

JOINT MESSAGE FORM					UNCLASSIFIED				
02 04		AUG	80	RR	RR	UUUU				HQWE271652

PRIORITY ~~FROM~~ ROUTINE

1. ASD/SDCB HAS DETERMINED THAT RESPONSIBILITY FOR THE FOLLOWING SERVICE REPORT SHOULD BE TRANSFERED TO YOUR ORGANIZATION IAW T.O. 00-35D-54. THE SR IS BEING RE-TRANSMITTED FOR YOUR ACTION.

1 FROM: AFPRO BOEING SEATTLE

SUBJECT: NBSVT EMERGENCY MODE - HAZARD IV

3 RCN: AF1CTT-89-0005

4 D DEF DISC: 89/11/20

5 NSN: N/A

6 NOM: NBSVT EMERGENCY MODE

7 MAN,CODE,SHIPPER: N/A, N/A, N/A

SOURCE OF REPAIR OR OVH: N/A

8 MFR PN: N/A

9 SERIAL NUMBER/LOT NUMBER/PATCH NUMBER: N/A

10 CONTR, PO, DOC NR: N/A

11 NEW OR OVH:

12 D MFD, OR OVHL:

13 OTF: 0

14 GFM: Yes

15 QTY A. RECD: 0 B. INSP: 0 C. DEF: 0

CRAIG CASSINO
ASD/SDCB, 55017

UNCLASSIFIED

TRANSFER.$RF continued
Transfer MIP Responsibility

JOINT MESSAGE FORM | UNCLASSIFIED

03 04 | AUG 80 | RR RR | UUUU | HQWE271652

16 I.C.MARKS ON OR WITH:

A. END ITEM NOM: AF-1 SER NR: 82-8000

B. NEXT HIGHER ASSEMBLY: NSN: UNKNOWN

NOM: UNKNOWN

PT NR: UNKNOWN

SER NR: UNKNOWN

17 DOL VAL: 0

18 EST COR COST: 0

19 ITEM UNDER WARRANTY: N

20 WUC:

21 EXHIBIT DISPOSITION INSTRUCTIONS:

STATUS: NONE

ADDRESS: NONE

22 DETAILS:

A. CIR PRIOR TO DIF: ROUTINE ACCEPTANCE TESTING.

B. DESC AND CAUSE OF DIF: WHEN THE POWER IS REMOVED FROM THE MCS SWITCH THE N8 SVT USED FOR THE EMERGENCY MODE GOES INTO AN OFF-HOOK STATUS AND BECOMES INOPERABLE.

C. ACT TAKEN OR RECM: REWORK OF MCS EMERGENCY MODE BY E-SYSTEMS.

CRAIG CASSINO
ASD/SDCB, 55017

UNCLASSIFIED

TRANSFER.$RF continued
Transfer MIP Responsibility

JOINT MESSAGE FORM						UNCLASSIFIED				
04 04		AUG	90	RR	RR	UUUU				HOWE271652

D. FROM: TECH INFO: NONE

E. TO: TECH DATA DEF: NONE

F. SUPPORT DATA MAILED: NONE

G. SRD: NONE

H. CMD CODE:

I. OTHER PERTINENT DATA:

a. SR EXH HOLD ACT: NONE

b. PERT DATA: NONE

c. PHOTO SUP: NONE

d. AIRCREW DATA: NONE

J. COGN OFF: CAPT MATT SIMMONS, (316) 526-0031

K. CERT OFF: NONE

2. REQUEST YOU ACKNOWLEDGE ACCEPTANCE OF THE MIP BY PROVIDING THIS OFFICE WITH YOUR NEW MIP NUMBER AND ACTION POINT. UPON CONCLUSION OF THE INVESTIGATION, PLEASE PROVIDE YOUR RESULTS.

CRAIG CASSINO
ASD/SDCB, 55017

UNCLASSIFIED

INTERNAL.$RF
Internal Status Report

AIR FORCE ONE SR STATUS REPORT

90/07/18 Page 1

AF1CTT-89-0001 MCS Switch Software Craig Cassino as of:

STATUS: TRANSFERED TO OC-ALC

OPEN
THE MIP HAS BEEN OPEN FOR 232 DAYS.

AF1CTT-89-0002 KG84 Data Inversion Craig Cassino as of:

STATUS: TRANSFERED TO OC-ALC

OPEN
THE MIP HAS BEEN OPEN FOR 232 DAYS.

AF1CTT-89-0003 FM Handset Interface Craig Cassino as of:

STATUS: BMA CURRENTLY WORKING

OPEN
THE MIP HAS BEEN OPEN FOR 232 DAYS.

AF1CTT-89-0004 SATCOM Craig Cassino as of:90/05/12

STATUS: CLOSED AT MRB

CLOSED

AF1CTT-89-0005 NBSVT Emergency Mode Craig Cassino as of:

STATUS: Transfered to OC-ALC

OPEN
THE MIP HAS BEEN OPEN FOR 231 DAYS.

SUMMARY INFORMATION

THERE IS A TOTAL OF 5 MIPS IN THIS REPORT
4 ARE OPEN MIPS
1 ARE CLOSED MIPS
0 ARE NOT COUNTED AS OPEN OR CLOSED

EXTERNAL.$RF
External Status Report

AIR FORCE ONE SR STATUS REPORT

90/07/18 page 1

AF1CTT-89-0001 MCS Switch Software

STATUS: TRANSFERED TO OC-ALC

OPEN

AF1CTT-89-0002 KG84 Data Inversion

STATUS: TRANSFERED TO OC-ALC

OPEN

AF1CTT-89-0003 FM Handset Interface

STATUS: BMA CURRENTLY WORKING

OPEN

AF1CTT-89-0004 SATCOM

STATUS: CLOSED AT MRB

CLOSED

AF1CTT-89-0005 NBSVT Emergency Mode

STATUS: Transfered to OC-ALC

OPEN

INTERIM.$RF
Interim Status Message

JOINT MESSAGE FORM | UNCLASSIFIED

01 02 | AUG | 90 | RR | RR | UUUU | HQWE27[illegible]714

FROM: ASD WRIGHT PATTERSON AFB OH//SDC//

TO: AFPRO BOEI[illegible] CO WICHITA KS//TM/XP/FO/EP/QA//

INFO HQ MAC SCOTT AFB IL//XPT/XRS/LGM/LGMWB/SE/
DOV/IGF/MAQ//
89MAW ANDREWS AFB MD//PPO/MAOP/MAQ/SE//
4950TESTW WRIGHT PATTERSON AFB OH//DOB/DOBF/FFDS//
USAF ALCENT POPE AFB NC//TE//
HQ AFLC LOC WRIGHT PATTERSON AFB OH//ATS//
SAF WASHINGTON DC//AQQL//
HQ AFSC ANDREWS AFB MD//XRC//
DIR MAT MGT TINKER AFB OK//MMA/MMAM/MMSRA/QA/
MMEDT//
HQ AFOTEC KIRTLAND AFB NM//TEZ//

ACCT AF-ACXJRF

UNCLAS

AFPRO: PLEASE PASS A COPY TO DAVE CHABOTY, BUILDING 23L, K70-35

VC-25A COMBINED TEST TEAM, 526-0031

SUBJECT: AF-1 CAT II SERVICE REPORT

REFERENCE YOUR MESSAGE, 221842 NOV 89

PRIORITY ROUTINE

CRAIG CASSINO
ASD/SDC8, 55017

UNCLASSIFIED

INTERIM.$RF continued
Interim Status Message

JOINT MESSAGE FORM					UNCLASSIFIED				
02 02		AUG	90	RR	RR	UUUU				H0WE271714

1. ASD/S[redacted]IS CURRENTLY PERFORMING AN INVESTIGATION (MIP NUMBER DCB-89-0005) TO DETERMINE THE CAUSE OF THE REPORTED DEFICIENCY.

RCN: AF1CTT-89-0005 S/N: N/A

WUC: MFG P/N: N/A

NOM: NBSVT EMERGENCY MODE

NSN: N/A

ASD/SDCB MIP MONITOR IS CRAIG CASSINO, AUTOVON 785-5017..

2. YOU WILL BE ADVISED OF THE RESULTS PENDING COMPLETION OF THE INVESTIGATION.

UNCLASSIFIED

RESULTS.$RF
Contractor Results to Action Points

MEMO TO: Craig Cassino July 18, 1990

SUBJECT: AF-1 Material Improvement Project (MIP)

1. An formal investigation of AF-1 MIP #DCB-89-005 has been completed. The results are attached for your review. A suspense date of **August 01, 1990** has been established for your support points to provide comments to you concerning the MIP investigation results. If you determine that the investigation results and associated comments have been satisfactory addressed the MIP may be presented at the next MIP review board for closure. Please ensure all coorespondence is maintained for inclusion in our MIP historical files.

2. Please coordinate any additional coorespondence or MIP requirements with the SR contact point, Mrs. Kim Howell, 55017.

Kim Howell
AF-1 SR Contact Point
Directorate of Transports

1 Atch
Investigation Results

RESULTS2.$RF
Contractor Results to Support Points

MEMO TO: SDCC SDCD SDCE SDCBL SDCT July 18, 1990

SUBJECT: AF-1 Material Improvement Project (MIP) - Contractor's Investigation Results for MIP #DCB-89-005.

1. The attached investigation results are forwarded for your information. Craig Cassino is reviewing the MIP to determine what actions are necessary to resolve the descrepancy. Request you also review the attached letter and provide applicable comments to the action point, Craig Cassino, by **July 25, 1990** in order that he may take appropriate action.

2. Please coordinate any desired changes in suspense with the SP contact point, Mrs. Kim Howell, 55017.

Kim Howell
AF-1 SP Contact Point
Directorate of Transports

1 Atch
Investigation Results

1st Ind ( )

To: SDCB (Craig Cassino)

Review of the investigation results indicates:

( ) The results are satisfactory; therefore, the MIP should be presented at the next MIP review board for closure.

( ) The results are not satisfactory due to the following concerns:

SUMMARY.$RF
Upper Management Summary Report

MIP SUMMARY

FOCAL POINT:Mr Brubaker **RCN:AF1CTT-90-0008** **MIP #DCB-90-008**

NOMENCLATURE:Typewriter Stowage

PROBLEM SUMMARY: STOWABLE PROVISIONS FOR TYPEWRITER ARE NOT IN THE AIRCRAFT. ATDR WAS GENERATED. THE BOEING RESPONSE WAS TO STOW THE TYPEWRITER IN THE AFT LOWER LOBE. SPO DISAGEED.

SUPPORT POINT INVESTIGATION RESULTS:

RECOMMENDED CORECTIVE ACTION: Mr Brubaker will contact contractor for resolution. If none, contractrs letter will be sent directing contractor to provide appropriate space.

FOCAL POINT:Mr Brubaker **RCN:AF1CTT-90-0015** **MIP #DCB-90-015**

NOMENCLATURE:Guest & Staff TV Monitors

PROBLEM SUMMARY: The TV monitors in the Guest and Staff compartments are overheating and shutting down. Both monitors are mounted within the secretarial compartment, and there are no cooling fans or ventilation for cabinets enclosing the monitors.

SUPPORT POINT INVESTIGATION RESULTS:

RECOMMENDED CORECTIVE ACTION:

FOCAL POINT:Mr Brubaker **RCN:AF1CTT-90-0016** **MIP #DCB-90-016**

NOMENCLATURE:Entertain. Audio Speakers

PROBLEM SUMMARY: The Entertainment audio speakers in the executive suite can be heard on the PA through the ICS. Also, the speakers in the staff compartment and should be separately controlled.

SUPPORT POINT INVESTIGATION RESULTS:

RECOMMENDED CORECTIVE ACTION:

MRBCALL.$RF
MIP Review Board Announcement

JOINT MESSAGE FORM					UNCLASSIFIED				
01 02		AUG	HQ	RR	RR	UUUU				HQWE271719

FROM: ASD WRIGHT PATTERSON AFB OH//SDC//

TO: AFPRO BOEING CO WICHITA KS//TM/XP/FO/EP/QA//

INFO HQ MAC SCOTT AFB IL//XPT/XRS/LGM/LGMWB/SE/

DOV/IGF/MAQ//

89MAW ANDREWS AFB MD//PPO/MAOP/MAQ/SE//

4950TESTW WRIGHT PATTERSON AFB OH//DOB/DOBF/FFDS//

USAF ALCENT POPE AFB NC//TE//

HQ AFLC LOC WRIGHT PATTERSON AFB OH//ATS//

SAF WASHINGTON DC//AQQL//

HQ AFSC ANDREWS AFB MD//XRC//

DIR MAT MGT TINKER AFB OK//MMA/MMAM/MMSRA/QA/

MMEDT//

HQ AFOTEC KIRTLAND AFB NM//TEZ//

ACCT AF-ACXJRF

UNCLAS

AFPRO: PLEASE PASS A COPY TO DAVE CHABOTY, BUILDING 23L, K70-35

VC-25A COMBINED TEST TEAM, 526-0031

SUBJECT: VC-25A SERVICE REPORT / MATERIAL IMPROVEMENT PROJECT REVIEW BOARD

PRIORITY ROUTINE

KIM HOWELL
ASD/SDCB, 55017

UNCLASSIFIED

MRBCALL.$RF continued
MIP Review Board Announcement

JOINT MESSAGE FORM						UNCLASSIFIED				
02 02		AUG	90	RR	RR	UUUU				HOWE271719

1. A VC-[redacted] MATERIAL IMPROVEMENT PROJECT REVIEW BOARD WILL CONVENE ON 3 SEP 90 AT 1400, IN THE SDC CONFERENCE ROOM TO DISCUSS THE FOLLOWING SERVICE REPORTS:

MIP NUM:	RCN:	NOMENCLATURE:
DCB-89-005	AF1CTT-89-0005	NBSVT EMERGENCY MODE
DCB-90-001	AF1CTT-90-0001	CSO/CDS COOLING SYSTEM
DCB-90-005	AF1CTT-90-0005	LOWER LOBE LINER
DCB-90-008	AF1CTT-90-0008	TYPEWRITER STOWAGE

2. COMMENTS AND/OR QUESTIONS SHOULD BE DIRECTED TO MR DICK BRUBAKER, ASD/SDCB, (513) 255-5017.

KIM HOWELL
ASD/SDCB, 55017

UNCLASSIFIED

MRBSUM.$RF
MRB Agenda Charts

MIP SUMMARY

FOCAL POINT: Craig Cassino **RCN:**AF1CTT-89-0001 **MIP #**DCB-89-001

NOMENCLATURE:MCS Switch Software

PROBLEM SUMMARY: MCS SWITCH SOFTWARE WILL NOT ALLOW LANDINES THAT ARE ON HOLD TO BE CONNECTED TO A DATA MODEM FOR FULL DUPLEX OPERATION. THE ERROR MESSAGE IS INDICATING LANDLINES ARE NOT A COMPATIBLE DEVICE.

SUPPORT POINT INVESTIGATION RESULTS: THE ERROR MESSAGE ASSOCIATED WITH THIS PROBLEM IS ACEPTABLE SINCE THE LANDLINES ARE NOT A COMPATIBLE DEVICE TO BE DEDICATED AS TRANSMIT OR RECEIVE ONLY AT THIS POINT IN SUBJECT CONNECTION.

RECOMMENDED CORECTIVE ACTION: REVIEW OF MCS SPEC PARA 3.2.10.5.1 REVEALS THAT THE MCS SWITCH SOFTWARE IS REQ TO PROVIDE A LANDLINE CONNECTION W/ THE DATA MODEMS FOR FULL DUPLEX OPERATION. HOLD FUNCTION IS NOT MENTIONED IN THE SWITCHING ARRANGEMENT. ALC RESPONSE IS UNACCEPTABLE.

MRB DECISION | | **CLOSE** | | **OPEN**

ACTION ITEM #:_____ **ACTION AGENCY:**_____

Appendix F: Representative Output File Listing (EXHIBIT.$RF)

```
;;  THIS FILE PRODUCES EXHIBIT DISPOSITION INSTRUCTIONS IN THE FORM
;;  OF ADD FORM 173 MESSAGE.  WHEN PRINTED TO A DIABLO 630 PRINTER
;;  WITH AN OCR FONT BALL THE OUTPUT WILL MEET ALL FORMAT
;;  REQUIREMENTS.
;;
;;=============================================================================
;;                                    MESSAGE HEADER
;;=============================================================================
.REPORT DIVISION
.DEFINITIONS
;;  DETERMINE AND FORMAT THE YEAR
.DEFINE YR AS TEXT 2
.LET YR = @YEAR(@TODAY)
;;  DETERMINE AND FORMAT THE MONTH
.LET MTH = @UC(@MONTH$(@TODAY))
;;   DETERMINE AND FORMAT THE DAY
.DEFINE DY AS TEXT 2
.LET DY = @DAY(@TODAY)
.IF DY = " 1"
.LET DY = " 01"
.ELSEIF DY = " 2"
.LET DY = "02"
.ELSEIF DY = " 3"
.LET DY = "03"
.ELSEIF DY = " 4"
.LET DY = "04"
.ELSEIF DY = " 5"
.LET DY = "05"
.ELSEIF DY = " 6"
.LET DY = "06"
.ELSEIF DY = " 7"
.LET DY = "07"
.ELSEIF DY = " 8"
.LET DY = "08"
.ELSEIF DY = " 9"
.LET DY = "09"
.ENDIF
;;  DETERMINE AND FORMAT THE HOUR
.DEFINE HR AS TEXT 2
.LET HR = SYS:TIME
.IF HR = " 1"
.LET HR = " 01"
.ELSEIF HR = " 2"
.LET HR = "02"
.ELSEIF HR = " 3"
.LET HR = "03"
.ELSEIF HR = " 4"
.LET HR = "04"
.ELSEIF HR = " 5"
.LET HR = "05"
.ELSEIF HR = " 6"
.LET HR = "06"
.ELSEIF HR = " 7"
```

```
.LET HR = "07"
.ELSEIF HR = " 8"
.LET HR = "08"
.ELSEIF HR = " 9"
.LET HR = "09"
.ENDIF
;;  DETERMINE AND FORMAT THE MINUTE
.DEFINE MN AS TEXT 2
.LET MN = @MINUTE(@TIME(SYS:TIME))
.IF MN = " 1"
.LET MN = " 01"
.ELSEIF MN = " 2"
.LET MN = "02"
.ELSEIF MN = " 3"
.LET MN = "03"
.ELSEIF MN = " 4"
.LET MN = "04"
.ELSEIF MN = " 5"
.LET MN = "05"
.ELSEIF MN = " 6"
.LET MN = "06"
.ELSEIF MN = " 7"
.LET MN = "07"
.ELSEIF MN = " 8"
.LET MN = "08"
.ELSEIF MN = " 9"
.LET MN = "09"
.ENDIF
;;  DEFINE AND FORMAT THE COMBINED DAY, HOUR, AND MINUTE FOR
OUTPUT
.DEFINE DD AS TEXT 6
.LET DD = DY & HR & MN
;; ESTABLISH THE PRIORITY OF THE MESSAGE BASED ON THE MIP
;; CATEGORY (I OR  II)
.DEFINE  P AS TEXT 2
.DEFINE PRIOR AS TEXT 7
.IF I60 = "I"
.LET P = "PP"
.LET PRIOR = "      "
.IF I60 = "II"
.LET P = "RR"
.LET PRIOR = "ROUTINE"
.ENDIF
;*************************************************************
;;            DEFINE AND FORMAT BODY OF MESSAGE
;*************************************************************
;; FORMAT THE SUBJECT OF THE MESSAGE BASED ON THE PROGRAM AND
;; CATEGORY SR
.DEFINE SUBJECT AS TEXT 56
.LET SUBJECT = (@UC(@TRIM(I280&-"CAT"&-I60&-" SERVICE REPORT")
;;  FORMAT MIP INFORMATION SUCH AS ACTION POINTS NAME AND SR
;; NOMENCLATURE
.DEFINE NAME AS TEXT 20
.LET NAME = @UC(FOCAL)
.DEFINE NOMEN AS TEXT 25
.LET NOMENC = @UC(N OMEN
```

```
.REFORMAT ON
;; QUERY SRMIS TO DETERMINE IF INVESTIGATION REQUIREMENTS HAVE
;; BEEN PREVIOUSLY ESTABLISHED.
.DEFINE WHAT AS TEXT 60
.DEFINE WHAT1 AS TEXT 60
.DEFINE ADDCOUNT AS INTEGER 2
.LET ADDCOUNT = @LEN(I664)
.IF I1140 = YES AND ADDCOUNT > 2
.LET WHAT = "AN ANALYSIS OF THE EXHIBIT WILL BE MADE.  SHIP THE EX-
HIBIT"
.LET WHAT1 = "TO THE FOLLOWING ADDRESS USING THE FASTEST
TRACEABLE MEANS."
.GOTO YES
.ELSE
.GOTO ASK1
.ENDIF
;; REQUEST EXHIBIT INSTRUCTIONS FROM THE SCREEN AND DEFINE
;;  REQUIREMENTS.
.LABEL ASK1
.DEFINE TODO AS TEXT 1
.INPUT "DO YOU WANT EXHIBIT A) HELD B) DISPOSED OF C) SENT TO...?"
TODO
.IF TODO = "A"
.LET WHAT = "AN INVESTIGATION IS ON-GOING.  REQUEST YOU CONTINUE
TO"
.LET WHAT1 = "HOLD THE EXHIBIT FOR AN ADDITIONAL 30 DAYS.:
.ELSEIF TODO = "B"
.LET WHAT  = "NO EXHIBIT IS REQUIRED FOR THIS INVESTIGATION.  YOU
MAY"
.LET WHAT1 = "RELEASE THE EXHIBIT  INTO NORMAL SUPPLY CHANNELS."
.ELSEIF TODO = "C"
.LET WHAT = "AN ANALYSIS OF THE EXHIBIT WILL BE MADE.  SHIP THE EX-
HIBIT"
.LET WHAT1 = "TO THE FOLLOWING ADDRESS USING THE FASTEST
TRACEABLE MEANS."
.DEFINE CORP AS TEXT 30
.INPUT "WHO SHOULD RECEIVE THE EXHIBIT AT THE COMPANY?" POC
.DEFINE ADD1 AS TEXT 30
.INPUT "WHAT IS THE ADDRESS OF THE COMPANY?" ADD1
.DEFINE ADD2 AS TEXT 30
.INPUT "WHAT IS THEIR CITY, STATE, AND ZIP? "ADD2
.LET I1140 = YES
.LET I1180 = CORP
.LET I660 = POC
.LET I662 = ADD1
.LET I664 = ADD2
;;  UPDATE SRMIS WITH NEW EXHIBIT DISPOSITION INSTRUCTIONS
.WRITE SRMIS
.ELSE
.GOTO ASK1
.ENDIF
.GOTO NO
;; RENAME VARIABLES FROM SRMIS DATABASE VARIABLES
.LABEL YES
.LET CORP = @UC(@TRIM (I1180))
.LET POC = @UC(@TRIM (I660))
```

```
.LETADD1 = @UC(@TRIM (I662))
.LET ADD2 = @UC(@TRIM (I664))
.LABEL NO
;; COMBINE FOCAL POINT NAME AND PHONE NUMBER FOR OUTPUT.
.DEFINE FP AS TEXT 3∞
.LET FP = @UC(@TRIM(FOCAL)&",&-" AUTOVON 785-5017.")
;*****************************************************************
;;                        PRINT MESSAGE
;*****************************************************************
;; BEGIN PRINTING MESSAGE TO PRINTER USING PARTICULAR MIP
;; INFORMATION.
.BODY
.REFORMAT OFF
                        UNCLASSIFIED

01 02       [MTH][YR] [P]  [P]   UUUU                          HOWE[DD  ]


      ASD WRIGHT PATTERSON AFB OH//SDC//

      AFPRO BOEING CO WICHITA KS//4950TESTW/CTT//

INFO  HQ MAC SCOTT AFB IL//XPT/XPQ/LGM/LGMWB/SE/

        DOV/IGF/MAQ//

      89MAW ANDREWS AFB MD//PPO/MAOP/MAQ/SE//

      4950TESTW WRIGHT PATTERSON AFB OH//ATS//

      DIR MAT MGT TINKER AFB OK//JMMA/MMSGG/MMSRA/QA/MMEDT//

      ACCT AF-ACXJRF

UNCLAS

AFPRO:  PLEASE PASS A COPY TO DAVE CHABOTY, BUILDING 23L,

VC-25A COMBINED TEST TEAM, 526-0031

SUBJECT: EXHIBIT DISPOSITION FOR [SUBJECT(55)]

REFERENCE YOUR MESSAGE,  [J10]

PRIORITY [PRIOR]

1.  MIP NUMBER:  MIP [MIPNUM]
.REFORMAT OFF

RCN: [RCN              ]   S/N: [I180]

WUC: [WUC              ]  MFG P/N: [MFGPART]
.REFORMAT ON

NOM:  [NOMENC]
```

[NAME]
ASD/SDCB, 55017

UNCLASSIFIED

UNCLASSIFIED

.REFORMAT OFF
02 02 [MTH][YR] [P] [P] UUUU HOWE[DD]
.REFORMAT ON

NSN: [NSN]

ASD/SDCB MIP MONITOR IS [FP]

2. [WHAT]

[WHAT1]

[CORP]

[POC]

[ADD1]

[ADD2]

Bibliography

1. Aeronautical Systems Division, Air Force Systems Command. C-5B Service Report Plan. Wright-Patterson AFB OH, 24 February 1986.

2. Aeronautical Systems Division, Air Force Systems Command. VC-25A Service Report/Material Improvement Program (SR/MIP) Plan. Wright-Patterson AFB OH, 1 November 1989.

3. Aggarwal, A. K. and D. Stevenson. "Agency Information Systems For An Insurance Company," Journal of Systems Management, 39: 14-19 (September 1988).

4. Anderson, Evan E. "The Implementation of Information Systems for Workers: A Structural Equation Model," Information and Management, 16: 171-185 (April 1989).

5. Blank, Mark M. and Kevin M. Ryan. "Information Systems Output: Shortcomings and Suggestions," Journal of Systems Management, 39: 21-25 (August 1988).

6. Bruns, William J. and F. Warren McFarlan. "Information Technology Puts Power in Control Systems," Harvard Business Review, 65: 89-94 (September-October 1987).

7. Cook, Peter G. "The role of Champions in Successful Computer Application," ACM SIGOIS Bulletin, 9: 1-13 (January 1988).

8. Department of the Air Force. USAF Materiel Deficiency Reporting and Investigating System. TO 00-35D-54. Washington DC: HQ USAF, 1 August 1989.

9. Er, M. C. "Prototyping, Participative and Phenomenological Approaches to Information Systems Development," Journal of Systems Management, 38: 12-16 (August 1987).

10. Hammer, Carl. "Is Today's Office Receiving Full Value From Its Computers?," Information and Management, 15: 15-23 (August 1988).

11. Igbaria, Magid. and others. "Microcomputer Applications: An Empirical Look at Usage," Information and Management, 16: 187-195 (April 1989).

12. Isaac, Stephen and Williiam B. Michael. Handbook in Research and Design. San Diego: EdITS Publishers, May 1978.

13. Le Blanc, Louis A. and M. Tawfik Jelassi. "DSS Software Selection: A Multiple Criteria Decision Methodology," Information and Management, 17: 49-64 (August 1989).

14. Maiocchi R. and B. Pernici. "Verification and Refinement of Office Procedures," Proceedings of the IEEE Computer Society Office Automation Symposium. 206-216 Gaithersburg MD: Computer Society Press of the IEEE, New York, 1987.

15. Mazer, Murray S. "Problems in Modeling Tasks and Task Views," ACM SIGOIS Bulletin, 9: 38- 45 (April-July 1988).

16. Plenert, Gerhard. "The Basics of a Successful System,"Information and Management, 15: 251-254 (December 1988).

17. Ricardo, Catherine. Database Systems: Principles, Design, and Implementation. New York: Macmillan, 1990.

18. Sipior, Janice C. and G. Lawrence Sanders. "Definitional Distinctions and Implications for Managing End User Computing," Information and Management, 16: 115-123 (March 1989).

19. Sumner, Mary and Robert Schultheis. Management Information Systems The Manager's View. Homewood IL: Irwin, 1989.

20. Verrijn-Stuart, A. A. and K. Anzenhofer. "Information Systems User-Designer Communication Problems," Information and Management, 14: 133-142 (March 1988).

21. Walton, Mary. The Deming Management Method. New York: Putnam Publishing Group, 1986.

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13. ABSTRACT *(Maximum 200 words)*

This study conducted research into the development, implementation, and evaluation of a personal computer based Service Reporting(SR) Management Information System (MIS). The Enable software application program was developed as a result of reviewing TO 00-35D-54, USAF Materiel Deficiency Reporting and Investigation System; interviews with MIS experts and system program office acquisition managers; and software prototyping with an Aeronautical Systems Division (ASD) System Program Office (SPO). Following a trial period, feedback was solicited through questionnaires and personal interviews with SPO personnel and the HQ AFLC manager responsible for the policy and procedures established in TO 00-35D-54. The PC system was then demonstrated to other SPO SR managers and the manager responsible for ASD SR policy. The purpose of the PC based system is to provide SPO managers with an alternative to the existing manual or mainframe material deficiency data recording, tracking, and reporting systems. The management information system provided a logical method for data input; performed the processing necessary to assist managers with trend and performance analysis; and output program office memos, contractor correspondence, messages to external organizations, and upper management status reports.

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